# Annual Report to Congress on Federal Government Energy Management and Conservation Programs Fiscal Year 2000

**December 13, 2002**

**U.S. Department of Energy**
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**Federal Energy Management Program**
**Washington, DC 20585**

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## AGENCY ACRONYMS

| | |
|---|---|
| Commodity Futures Trading Commission | CFTC |
| Central Intelligence Agency | CIA |
| Department of Agriculture | USDA |
| Department of Commerce | DOC |
| Department of Defense | DOD |
| Department of Energy | DOE |
| Department of Health and Human Services | HHS |
| Department of Housing and Urban Development | HUD |
| Department of the Interior | DOI |
| Department of Justice | DOJ |
| Department of Labor | DOL |
| Department of State | ST |
| Department of Transportation | DOT |
| Department of the Treasury | TRSY |
| Department of Veterans Affairs | VA |
| Environmental Protection Agency | EPA |
| Equal Employment Opportunity Commission | EEOC |
| Federal Communications Commission | FCC |
| Federal Emergency Management Agency | FEMA |
| Federal Energy Regulatory Commission | FERC |
| Federal Trade Commission | FTC |
| General Services Administration | GSA |
| International Broadcasting Bureau | IBB |
| National Aeronautics and Space Administration | NASA |
| National Archives and Records Administration | NARA |
| National Science Foundation | NSF |
| Nuclear Regulatory Commission | NRC |
| Office of Personnel Management | OPM |
| Panama Canal Commission | PCC |
| Railroad Retirement Board | RRB |
| Social Security Administration | SSA |
| Tennessee Valley Authority | TVA |
| United States Information Agency | USIA |
| United States Postal Service | USPS |

## INTERNET WEB SITES CITED IN THIS REPORT

| | |
|---|---|
| Federal Energy Management Program | www.eren.doe.gov/femp |
| Energy Efficiency and Renewable Energy Clearinghouse | www.eren.doe.gov |
| National Energy Information Center | www.eia.doe.gov |
| Alternative Fuels Data Center | www.afdc.nrel.gov |
| Clean Cities Program | www.ccities.doe.gov |

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## EXECUTIVE SUMMARY

This report on Federal Energy Management for Fiscal Year (FY) 2000 provides information on energy consumption in Federal buildings, operations, and vehicles and equipment, and documents activities conducted by Federal agencies to meet the statutory requirements of Title V, Part 3, of the National Energy Conservation Policy Act (NECPA), as amended, 42 U.S.C. §§ 8251-8259, 8262, 8262b-k, and Title VIII of NECPA, 42 U.S.C. § 8287-8287c. Implementation activities undertaken during FY 2000 by the Federal agencies under the Energy Policy Act of 1992 (EPACT) and Executive Order 13123, Greening the Government through Efficient Energy Management, are also discussed in this report. FY 2000 is the first full reporting year for Executive Order 13123, which was signed in June 1999.

Based on reports submitted to the Department of Energy (DOE) by 29 Federal agencies, the total primary energy consumption of the Government of the United States, including energy consumed to produce, process, and transport energy, was 1.39 quadrillion British Thermal Units (quads) during FY 2000.[1] These 1.39 quads consumed by the Government in buildings and operations to provide essential services to its citizens, including the defense of the Nation, represent approximately 1.4 percent of the total 99.08 quads[2] used in the United States. In total, the Federal Government is the single largest energy consumer in the Nation, although its pattern of consumption is widely dispersed geographically.

The Government consumed 0.98 quads during FY 2000 when measured in terms of energy actually delivered to the point of use (site-delivered energy consumption). Unless otherwise noted, this report uses the site-measured conversion factors to convert common units for electricity and steam to British Thermal Units (Btu). The total site-delivered energy consumption in FY 2000 was 32.4 percent less than the FY 1985 base year. This reduction of 470.8 trillion Btu, which reflects both a drop in Government activity and the success of energy management efforts, could satisfy the energy needs of the State of Montana for more than one year.[3] The total cost of the 0.98 quads was $7.4 billion in FY 2000.[4] This is $3.5 billion less than the $10.5

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[1]Primary energy consumption considers all energy resources used to generate and transport electricity and steam. Tables 1-A, 5-A, and 8-B show primary energy consumption for comparison with site-delivered consumption shown in Tables 1-B, 5-B, and 8-A respectively. Conversion factors of 10,346 Btu per kilowatt hour for electricity and 1,390 Btu per pound of steam are used to calculate gross energy consumption.

[2]DOE/EIA-0035(2001/7), *Monthly Energy Review*, July 2001.

[3]Based on site-delivered energy consumption estimates for 1999 in the residential, commercial, industrial, and transportation sectors (312.4 trillion Btu). Source: DOE/EIA-0214(99), *State Energy Data Report, 1999,* Table 9; May 2001.

[4]Unless otherwise noted, all costs cited in this report are in constant 2000 dollars, calculated using Gross Domestic Product implicit price deflators. See DOE/EIA-0384(99), *Annual Energy Review 2000*, Table E1; July 2001). Costs noted as nominal dollars reflect the price paid at the time of the transaction and have not been adjusted to remove the effect of changes in the spending power of the dollar.

billion reported in FY 1985, a 30.0 percent[5] decrease in nominal costs. In constant 2000 dollars, this equates to a decrease of 51.8 percent from $15.3 billion in FY 1985 to $7.4 billion in FY 2000. The Federal energy bill for FY 2000 decreased 9.3 percent from the previous year. These reductions in energy costs are attributable primarily to reduced energy prices and reduced Government activity, although they also reflect the effects of agency energy management efforts. Many other variables also contribute to fluctuations in annual energy consumption and costs, including changes in building square footage, building stock, weather, tempo of operations, fuel mix, and vehicle, naval, and aircraft fleet composition.

Federal agencies report energy consumption under four categories: standard buildings; industrial, laboratory and other energy intensive facilities; exempt facilities; and vehicles and equipment.

**Standard Buildings**

In FY 2000, the Federal Government used 326.8 trillion British Thermal Units (Btu) to provide energy to almost 3.1 billion square feet of standard buildings space. This consumption represents a 22.6 percent decrease compared to FY 1985 and a 2.1 percent decrease relative to FY 1999. These significant drops reflect the success of Federal energy management efforts in reducing fossil fuel use in Federal facilities. The cost of energy for buildings and facilities in FY 2000 was $3.4 billion, a decrease of approximately $61.3 million from FY 1999 expenditures, and a decrease of 35.3 percent from the FY 1985 expenditure of $5.2 billion.[6] These cost savings are attributable largely to reduced energy prices and successful energy management.

**Industrial, Laboratory and Other Energy Intensive Facilities**

Under section 543(a)(2) of NECPA, as amended by EPACT, 42 U.S.C. § 8253, buildings that house energy-intensive activities may be excluded from NECPA's performance goal for buildings. Most energy used in these facilities is process energy. Process energy is consumed in industrial operations, laboratories, certain R&D activities, and in electronic-intensive facilities.

Section 203 of Executive Order 13123 sets a goal for these facilities that requires each agency to reduce energy consumption per square foot, per unit of production, or per other unit as applicable by 20 percent by 2005 and 25 percent by 2010 relative to 1990.

In FY 2000, the Federal Government used 67.0 trillion Btu of energy in energy intensive operations, approximately 6.8 percent of the total 0.98 quads consumed. Total energy consumption in this category decreased 10.9 percent relative to FY 1990 and increased 8.0 percent relative to FY 1999. These changes resulted from both changes in activity levels and energy management efforts.

The Federal Government spent $611.2 million on energy intensive operations energy in FY 2000, $60.6 million more than the FY 1999 expenditure of $550.6 million constant dollars.

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[5]Calculation of percent changes in this report do not account for rounding of numbers in text.

[6]Cost and consumption figures for FY 1985 may be different from those published in last year's Annual Report since Federal agencies update their files and provide revisions to their data.

**Exempt Facilities**
Sec. 704 of the Executive Order 13123 defines "Exempt facility" as "a facility. . .for which an agency uses DOE-established criteria to determine that compliance with the Energy Policy Act of 1992 or [Executive Order 13123] is not practical." Five agencies, the Departments of Defense, Health and Human Services, and Transportation, the National Aeronautics and Space Administration, and the General Services Administration (GSA) have chosen to exempt facilities from Executive Order requirements. In addition, the U.S. Postal Service has reported electricity consumption used in mail processing automation under this exempt category without reporting associated facility square footage. Energy used in exempt facilities accounts for approximately 2.1 percent of the total 0.98 quads used by the Federal Government. Electricity constitutes 74.8 percent of the energy used in exempt facilities, 4.8 percent is accounted for by natural gas, and 13.7 percent by fuel oil. Small amounts of purchased steam, liquefied petroleum gas (LPG)/propane, and "other" energy account for the remaining 6.7 percent.

The energy used in exempt facilities in FY 2000 accounted for approximately 3.6 percent of the total Federal energy bill. The Federal Government spent approximately $264.0 million for this category's energy during the fiscal year. FY 2000 was the first year agencies reported energy data under this category and agencies were not consistent in revising all previous years' data. Therefore, comparisons of overall exempt energy use with previous years are not appropriate.

**Vehicles and Equipment**
The vehicles and equipment category includes aircraft and naval fuels, automotive gasoline, diesel fuel consumed by Federally-owned and leased vehicles and privately-owned vehicles used for official business, and the energy used in Federal construction.

In FY 2000, the Federal Government used approximately 566.1 trillion Btu of energy in vehicles and equipment, 57.7 percent of the total 0.98 quads consumed. Total energy consumption in vehicles and equipment decreased 39.4 percent relative to FY 1985 and was 6.8 percent less than the FY 1999 consumption of 607.5 trillion Btu. Most of these decreases are attributable to declines in the operation of vehicles and aircraft by the Department of Defense. The Department of Defense consumed 521.7 trillion Btu or 92.2 percent of all vehicles and equipment energy used by the Federal Government.

The Federal Government spent $3.1 billion on vehicles and equipment energy in FY 2000, $888.2 million less than the FY 1999 expenditure.

**Investments in Energy Efficiency**
During FY 2000, Federal agencies had three primary options for financing energy efficiency, water conservation, and renewable energy projects in buildings and facilities: direct appropriated funding, energy savings performance contracts (ESPCs), and utility energy service contracts (UESCs). Known funding from the three sources totaled approximately $599 million in FY 2000. Direct appropriations accounted for approximately $121 million. ESPC contracts awarded in FY 2000 resulted in approximately $287 million in estimated contractor investment ($62 million from DOE Super ESPC delivery orders and $225 million from other agency ESPCs), and approximately $191 million in private sector investment came from utility energy service contracts. While these three categories of funding are not entirely comparable, they do indicate

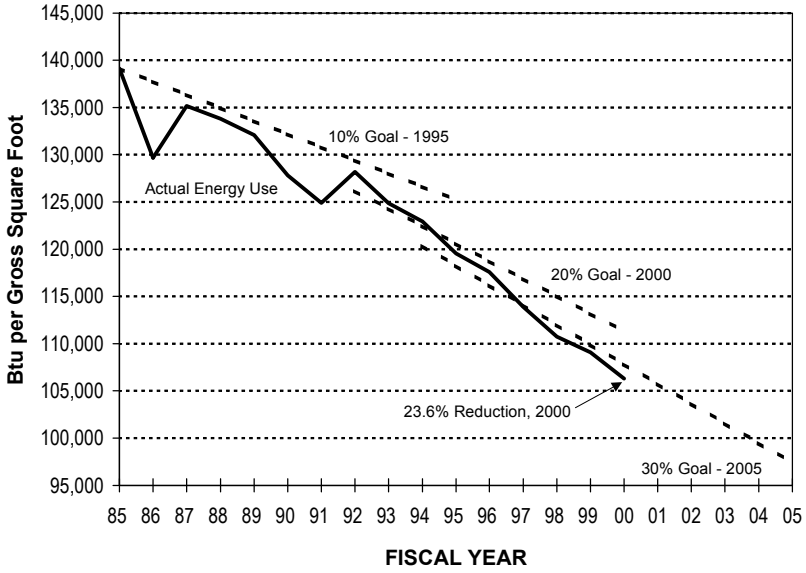
that ESPCs and UESCs have become the dominant source of support for efficiency investments throughout the Federal Government. Energy efficiency investment from ESPCs and UESCs increased 17.4 percent from $395.3 million in FY 1999 to $478.5 million in FY 2000. In FY 1998, investment from these sources totaled only $142.6 million. In FY 2000, direct funding identified by agencies for energy conservation retrofits and capital equipment decreased 41.0 percent to $121.1 million from $205.2 million dollars in FY 1999.

Since 1985, The Government has invested approximately $3.8 billion in energy efficiency, $2.5 billion of which was direct appropriations and $1.3 billion from alternative financing mechanisms ($0.8 billion from ESPCs and $0.5 billion from UESCs).

**Agency Progress in Meeting Energy Reduction Goals**

NECPA, as amended by EPACT, requires agencies to take the steps necessary to reduce energy consumption in Federal buildings by 10 percent by 1995 compared to 1985 consumption levels, based on Btu per gross square foot, and requires a 20 percent reduction by 2000 compared to 1985 consumption levels. The 10 percent goal was met by the Government in FY 1995 with a 12.7 percent reduction from FY 1985. Executive Order 12902 added a goal of reducing energy consumption by 30 percent by the year 2005 relative to 1985 consumption levels. Executive Order 13123 adds an additional goal of a 35 percent reduction by 2010, compared to FY 1985. During FY 2000 agencies provided data to DOE that indicated a decrease in energy consumption per gross square foot of 23.6 percent relative to FY 1985. The Government's performance for each year since FY 1985 is illustrated in Figure ES-1. This reduction was the result of significant decreases in the consumption of fuel oil, natural gas, and coal. The use of non-electric fuels in Federal buildings has declined 61.0 percent since 1985, while the consumption of electricity has increased by only 1.1 percent. The installation and increased use of electricity-driven electronic equipment contributed to increases in electricity through the years. Electricity now represents about 74.0 percent of the total energy costs of Federal buildings and accounts for 44.7 percent of total site-delivered energy consumption in buildings. This is compared to 31.1 percent of the total site-delivered energy consumption in buildings in FY 1985. Agency efforts undertaken in FY 2000 to increase energy efficiency in buildings included:

**FIGURE ES-1**
**Decrease in Btu per Gross Square Foot in Federal Standard Buildings and Facilities from FY 1985**

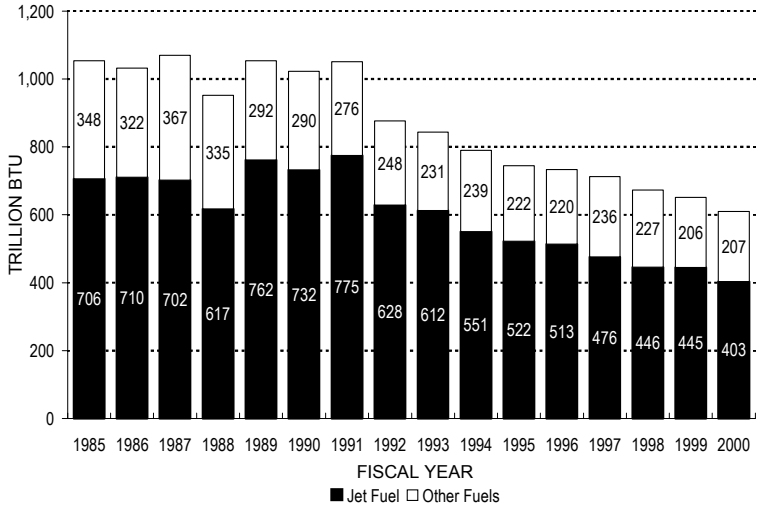


- improvement of operations and maintenance procedures;
- implementation of no-cost, low-cost efficiency measures;
- energy-efficient building retrofits and capital improvements;
- energy awareness activities and employee training programs; and
- procurement of energy-efficient goods and products.

**Reducing Petroleum-Based Fuel Consumption**

Effective management of energy resources is of strategic importance to the Federal Government as well as the Nation. In FY 2000, petroleum-based fuels accounted for 0.61 quads of the total 0.98 quads consumed by the Federal Government, with 0.56 quads used by the Department of Defense, primarily for jet fuel and distillate/diesel for vehicles and equipment. The Federal Government consumed 42.1 percent less petroleum-based fuel in FY 2000 than in FY 1985. Figure ES-2 illustrates the trend in the Federal Government's use of petroleum fuels.

**FIGURE ES-2**
**Federal Consumption of Petroleum-Based Fuels FY 1985 through FY 2000**




Section 205 of Executive Order 13123 directs agencies to minimize the use of petroleum-based fuels in buildings and facilities. Federal agencies have made significant progress in reducing their dependence on petroleum-based fuels in their buildings and facilities. For example, Federal agencies report that in FY 2000, 34.0 trillion Btu of petroleum-based fuels were used for buildings and facilities energy, a 65.1 percent decrease from FY 1985 and a 6.7 percent decrease from FY 1999. This represents 10.4 percent of total buildings and facilities energy consumption.

**Renewable Energy**

Section 204 of Executive Order 13123 restates the goal of the Million Solar Roofs Initiative, which is 2,000 solar roof installations in the Federal Government by 2000, and 20,000 installations by 2010. In the period from June 1997 to April 2000 the Federal Government installed 1,745 solar energy systems. This total included 1,682 solar hot water systems, 58 photovoltaic power systems and 5 transpired solar thermal collectors. The U.S. Navy installed an additional 1000 solar hot water systems by the end of FY 2000. This brought total installations to just over 2,700 systems by the end of 2000, accomplishing the Federal goal.

**Federal Energy Management Highlights**

Progress is being made in increasing Federal energy efficiency, although there remain opportunities for greater efficiency and cost reduction. Several of the most important findings of this report are listed below:

- The overall real cost of energy consumption in the Federal Government measured in constant 2000 dollars has fallen from $15.3 billion in FY 1985 to $7.4 billion in FY 2000. While most of this drop is attributable to declining energy prices and reduced Defense-related activity, energy management efforts made a significant contribution.[7]

- Total site-delivered energy consumption in FY 2000 decreased 32.4 percent from FY 1985; again, a reflection of both reduced Defense-related activity and successful energy management efforts.[7]

- Energy consumption in buildings in FY 2000 decreased 22.6 percent from FY 1985.[7]

- On a Btu-per-gross-square-foot basis, the 23.6 percent reduction in buildings site-delivered energy puts the Federal Government past the 20 percent reduction goal for 2000—a good indicator of the success of energy management efforts.

- Nine agencies, the Departments of Agriculture, Commerce, Defense, Energy, Justice, Transportation, the General Services Administration, the National Aeronautics and Space Administration, and the Tennessee Valley Authority have surpassed a 20 percent reduction in buildings energy use per gross square foot from 1985.

- Energy consumption in FY 2000 was used for the following purposes:

| ***End Use*** | ***Percentage*** | ***Cost*** |
|---|---|---|
| Standard Buildings | 33.3 percent | $3.4 billion |
| Energy Intensive Facilities | 6.8 percent | $0.6 billion |
| Exempt Facilities | 2.1 percent | $0.3 billion |
| Vehicles & Equipment | 57.7 percent | $3.1 billion |

[7]Many other variables also contribute to fluctuations in annual energy consumption and costs, including changes in building square footage, building stock, weather, tempo of operations, fuel mix, and vehicle, naval, and aircraft fleet composition.

# I. OVERVIEW OF FEDERAL ENERGY MANAGEMENT ACTIVITIES

## A. Overview of Federal Energy Management Policy and Legislative Mandates

This report on Federal Energy Management for Fiscal Year (FY) 2000 provides information on energy consumption in Federal buildings and operations and documents activities conducted by Federal agencies to meet the statutory requirements of Title V, Part 3, of the National Energy Conservation Policy Act (NECPA), as amended, 42 U.S.C. §§ 8251-8259, 8262, 8262b-k and Title VIII of NECPA, 42 U.S.C. § 8287-8287c. Implementation activities undertaken during FY 2000 by the Federal agencies under the Energy Policy Act of 1992 (EPACT) and Executive Order 13123, Greening the Government through Efficient Energy Management, are also discussed in this report. FY 2000 is the first full reporting year for Executive Order 13123, which was signed in June 1999. In compliance with section 381(c) of the Energy Policy and Conservation Act (EPCA), as amended, 42 U.S.C. § 6361c, this report also describes the energy conservation and management activities of the Federal Government under the authorization of section 381 of EPCA, 42 U.S.C. § 6361.

### Requirements of National Energy Conservation Policy Act (NECPA) and Energy Policy Act of 1992 (EPACT)

NECPA provides major policy guidance to Federal agencies to improve energy management in their facilities and operations. Amendments to NECPA made by the Federal Energy Management Improvement Act of 1988, 42 U.S.C. § 8253 (a)(1), required each agency to achieve a 10 percent reduction in energy consumption in its Federal buildings by FY 1995, when measured against a FY 1985 baseline on a Btu-per-gross-square-foot basis. It also directed DOE to establish life-cycle costing methods and coordinate Federal conservation activities through the Interagency Energy Management Task Force. Section 152 of Subtitle F of EPACT, Federal Agency Energy Management, further amends NECPA and contains provisions regarding energy management requirements, life-cycle cost methods and procedures, budget treatment for energy conservation measures, incentives for Federal facility energy managers, reporting requirements, new technology demonstrations, and agency surveys of energy-saving potential.

### Requirements of Executive Order 13123

On June 3, 1999, the President signed Executive Order 13123, Greening the Government Through Efficient Energy Management, superseding Executive Order 12902. This new Executive Order addresses greenhouse gas emissions from Federal facilities, and makes energy-efficiency targets more stringent.

The key requirements of the legislation and Executive Order authorities are outlined in the exhibit below along with current findings.

## KEY REQUIREMENTS OF LEGISLATIVE AND EXECUTIVE ORDER AUTHORITIES

| Statute/Directive | Requirement | FY 2000 Findings | Annual Report Discussion |
|---|---|---|---|
| Section 543, NECPA, 42 U.S.C., § 8253(a)(1)<br><br>Executive Order 13123 | 20 percent reduction (Btu/GSF) in Federal buildings by 2000 from 1985.<br><br>30 percent reduction (Btu/GSF) by 2005 from 1985.<br>35 percent reduction by 2010 from 1985. | Federal agencies reported a 23.6 percent decrease in energy consumption in buildings in FY 2000, compared to FY 1985. | Section II (B), page 59 |
| Section 544, NECPA, 42 U.S.C., § 8254 | DOE to establish life-cycle cost methods to determine cost-effectiveness of proposed energy efficiency projects. | The 2000 edition of the energy price indices and discount factors for life-cycle cost analysis was published and distributed to Federal energy managers. | Section I (D), page 42 |
| Section 545, NECPA, 42 U.S.C., § 8255 | Transmit to Congress the amount of appropriations requested in each agency budget for electric and energy costs incurred in operating and maintaining facilities and for compliance with applicable statutes and directives. | Approximately $121.1 million was appropriated and spent on energy efficiency projects in Federal facilities. | Section I (D), page 31 |
| Section 546, NECPA, 42 U.S.C., § 8256(a) | Establishment of a program of incentives within Federal agencies to expedite Energy Savings Performance Contracts. | In FY 2000, 81 ESPC contracts and delivery orders were awarded under DOE Super ESPCs and other agency contracts. | Section I (D), page 36 |
| Section 546, NECPA, 42 U.S.C., § 8256(b) | DOE to establish a Federal Energy Efficiency Fund to provide grants to agencies. | There were no appropriations for the Fund in FY 2000; FY 1995 funds were allocated and progress of the few remaining projects is being monitored. | Section I (D), page 35 |
| Section 157, EPACT, 42 U.S.C., § 8262(c) | Federal agencies to establish and maintain programs to train energy managers and to increase the number of trained energy managers within each agency. | DOE's FEMP conducted 59 training workshops and symposia for more than 5,353 attendees in the efficient use and conservation of energy, water, and renewable energy in Federal facilities. | Section I (D), page 21; Section VI, Agency Reports, page 81 |

| Statute/Directive | Requirement | FY 2000 Findings | Annual Report Discussion |
|---|---|---|---|
| Executive Order 13123 | 20 percent reduction for Federal industrial/laboratory facilities by 2005 from 1990.<br>25 percent reduction by 2010 from 1990. | Findings are specific to individual agencies. | Section III (B), page 65 |
| Executive Order 13123 | 30 percent reduction in greenhouse gas emissions attributed to Federal facilities by 2010 from 1990. | Carbon emissions from energy used in non-exempt Federal facilities declined 18.4 percent in FY 2000 compared to FY 1990. | Section I(B), page 16 |
| Executive Order 13123 | Expand use of renewable energy by implementing renewable energy projects and by purchasing electricity from renewable sources. The Federal Government will strive to install 20,000 solar roofs by 2010. | Findings are specific to individual agencies. | Section I(G), page 49<br>Section VI, Agency Reports, page 81 |
| Executive Order 13123 | Minimize petroleum use within Federal facilities through use of non-petroleum energy sources and eliminating unnecessary fuel use. | The consumption of petroleum-based fuels in buildings during FY 2000 decreased 65.1 percent compared to FY 1985 and 6.7 percent from FY 1999. | Section II(A), page 51 |
| Executive Order 13123 | Reduce total energy use and greenhouse gas emissions, as measured at the source. Agencies shall undertake projects to reduce source energy, even if site energy use increases. | Primary energy consumed in buildings and facilities in FY 2000 decreased 9.1 percent from FY 1985 and 0.7 percent from FY 1999.<br><br>Measured in terms of source energy, Federal buildings show a reduction of 9.9 percent in Btu/GSF during FY 2000 compared to FY 1985. | Section II(A), page 52, 54, and 62 |
| Executive Order 13123 | Reduce water consumption and associated energy use. | Findings are specific to individual agencies. | Section I(F), page 48<br>Section VI, Agency Reports, page 75 |

## B. Overall Federal Energy Consumption, Costs, and Carbon Emissions

As shown in Table 1-A, the total primary energy consumption of the Government of the United States, including energy consumed to produce, process, and transport energy, was 1.39 quadrillion British Thermal Units (quads) or 1,385,104.8 billion Btu during FY 2000. Primary energy consumption considers all resources used to generate and transport electricity and steam. (The source conversion factors of 10,346 Btu per kilowatt hour for electricity and 1,390 Btu per pound of steam are used to calculate primary energy consumption. See Appendix B for conversion factors used to calculate site-delivered energy consumption.) Federal agencies reported a 23.1 percent decrease in total primary energy consumption compared to FY 1985, and a 1.0 percent decrease from FY 1999. These reductions resulted from a combination of reduced Federal activity and successful energy management efforts. The 1.39 quads used in FY 2000 represent approximately 1.4 percent of the total 99.08 quads[8] used in the United States, and reflect Government energy consumption in buildings and operations to provide essential services to its citizens, including the defense of the Nation. In total, the Federal Government is the single largest energy consumer in the Nation, although its pattern of consumption is widely dispersed.

Based on reports submitted to DOE by 29 Federal agencies, the Federal Government consumed 0.98 quads during FY 2000 when measured in terms of energy actually delivered to the point of use. As shown in Table 1-B, Federal agencies reported a 32.4 percent decrease in total site-delivered energy consumption compared to FY 1985, and a 3.2 percent decrease from FY 1999. The cost of this energy was $7.4 billion and represented approximately 0.4 percent of the total Federal expenditures of $1.789 trillion[9] for all purposes in FY 2000. The Federal energy bill for FY 2000 fell 9.3 percent from the previous year, decreasing $756.3 million in constant dollars compared to FY 1999.[10] Many variables in addition to Federal energy management activities contribute to changes in annual energy use and costs, including changes in square footage, building stock, weather, tempo of operations, fuel mix, fuel prices, and vehicle, naval, and aircraft fleet composition.

In FY 2000, the Department of Defense spent $5.0 billion for energy out of the total Federal energy expenditure of $7.4 billion. Overall, the Department of Defense used 38.1 percent less site-delivered energy in FY 2000 than in FY 1985—a reflection of reduced Defense-related activity and successful energy management efforts.

Figures 1 and 2 depict the percentage of total energy used by the Federal Government in FY 2000 and its cost. As illustrated, jet fuel and electricity account for approximately 60.9 percent of the total energy consumption represented in Figure 1 and approximately 74.2 percent of the total energy costs in Figure 2.

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[8] DOE/EIA-0035(2001/7), *Monthly Energy Review*, July 2001.

[9] *Analytical Perspectives, Budget of the United States Government, Fiscal Year 2002*

[10] Appendix C indicates the annual cost of energy used in Federal buildings and facilities, vehicles and equipment, and energy intensive operations for FY 1985 through FY 2000. The combined cost per Btu for energy in each fiscal year is also shown in the table.

TABLE 1-A

TOTAL PRIMARY ENERGY CONSUMPTION BY FEDERAL AGENCIES

(In Billions of Btu, with Conversions to Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x $10^{15}$])

| CIVILIAN AGENCY | **FY 1985** | FY 1990 | FY 1991 | FY 1992 | FY 1993 | FY 1994 | FY 1995 | FY 1996 | FY 1997 | FY 1998 | **FY 1999** | **FY 2000** | %CHANGE 85-00 | %CHANGE 99-00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| USPS | **47,439.3** | 54,767.8 | 56,017.0 | 57,697.8 | 61,629.9 | 63,646.5 | 65,828.1 | 67,412.9 | 71,636.0 | 71,861.1 | **72,898.5** | **80,175.8** | 69.0 | 10.0 |
| DOE | **90,591.6** | 82,462.0 | 79,414.4 | 82,561.6 | 79,588.9 | 78,662.9 | 81,131.1 | 80,948.9 | 70,016.2 | 64,211.0 | **64,034.7** | **63,448.0** | -30.0 | -0.9 |
| VA | **40,266.0** | 41,421.0 | 42,232.9 | 42,374.9 | 43,203.9 | 43,487.6 | 43,909.9 | 45,441.5 | 46,267.8 | 46,877.0 | **47,069.4** | **46,401.8** | 15.2 | -1.4 |
| GSA | **43,052.8** | 34,789.6 | 33,524.8 | 32,994.1 | 33,742.8 | 33,253.4 | 32,839.0 | 33,660.0 | 33,822.4 | 33,583.7 | **34,448.6** | **38,271.6** | -11.1 | 11.1 |
| DOT | **27,287.5** | 26,939.8 | 27,491.0 | 28,618.9 | 31,616.7 | 28,321.4 | 27,789.3 | 30,288.1 | 28,755.8 | 29,597.7 | **36,377.8** | **36,652.3** | 34.3 | 0.8 |
| DOJ | **10,595.9** | 10,790.3 | 13,230.3 | 12,139.6 | 13,964.4 | 15,825.8 | 16,133.4 | 19,539.4 | 19,077.5 | 23,560.3 | **23,451.8** | **26,748.9** | 152.4 | 14.1 |
| NASA | **21,581.2** | 25,979.3 | 26,865.0 | 27,120.9 | 26,857.8 | 27,461.4 | 26,648.8 | 24,638.8 | 26,049.2 | 25,322.1 | **24,682.8** | **23,487.1** | 8.8 | -4.8 |
| HHS | **9,692.6** | 12,112.2 | 11,073.7 | 11,995.7 | 12,806.5 | 13,016.8 | 11,110.8 | 11,722.2 | 13,699.4 | 13,680.5 | **13,233.0** | **14,197.2** | 46.5 | 7.3 |
| USDA | **11,576.9** | 13,655.1 | 13,830.4 | 13,287.1 | 13,650.6 | 13,766.7 | 14,108.1 | 13,574.8 | 11,755.2 | 12,432.5 | **12,197.1** | **11,739.3** | 1.4 | -3.8 |
| DOI | **10,933.6** | 10,337.7 | 10,368.8 | 10,089.3 | 11,167.8 | 11,507.0 | 9,810.3 | 7,038.3 | 9,608.7 | 9,542.0 | **10,611.1** | **9,421.3** | -13.8 | -11.2 |
| TRSY | **3,715.2** | 6,627.1 | 7,851.0 | 8,589.2 | 8,271.4 | 8,210.2 | 7,469.3 | 6,946.5 | 8,918.0 | 8,496.8 | **8,729.3** | **8,669.0** | 133.3 | -0.7 |
| ST[1] | **6,224.6** | 6,358.0 | 6,347.8 | 747.0 | 1,162.4 | 1,248.5 | 1,288.9 | 1,830.2 | 7,623.4 | 7,572.6 | **7,178.5** | **7,266.7** | 16.7 | 1.2 |
| TVA [2] | **7,432.2** | 6,894.8 | 6,845.0 | 6,367.7 | 5,866.3 | 6,685.6 | 6,737.9 | 6,464.1 | 6,282.8 | 6,074.4 | **6,737.4** | **7,091.5** | -4.6 | 5.3 |
| DOL | **3,688.0** | 3,842.5 | 3,923.8 | 3,944.2 | 4,050.7 | 4,119.3 | 3,992.2 | 4,094.5 | 4,123.2 | 4,168.6 | **3,337.1** | **4,001.9** | 8.5 | 19.9 |
| DOC | **3,804.6** | 6,110.9 | 4,261.0 | 4,083.2 | 4,287.4 | 5,007.0 | 5,173.4 | 4,930.3 | 4,866.3 | 4,558.3 | **4,777.1** | **3,577.0** | -6.0 | -25.1 |
| EPA | **1,621.0** | 1,483.3 | 1,635.6 | 1,662.7 | 1,845.1 | 1,922.8 | 2,108.8 | 2,070.5 | 2,113.8 | 2,108.0 | **2,341.7** | **1,910.4** | 17.9 | -18.4 |
| HUD | **315.2** | 384.2 | 407.0 | 378.7 | 346.0 | 324.0 | 310.6 | 326.8 | 318.0 | 303.2 | **310.2** | **287.0** | -8.9 | -7.5 |
| FCC | **39.2** | 46.1 | 46.5 | 38.1 | 38.9 | 42.2 | 42.2 | 33.5 | 35.9 | 35.4 | **35.4** | **39.6** | 1.2 | 12.0 |
| PCC | **1,118.1** | 1,318.9 | 1,274.6 | 1,378.7 | 1,382.4 | 1,393.9 | 1,598.5 | 1,591.0 | 1,540.5 | 0.0 | **0.0** | **0.0** | -100.0 | N/A |
| OTHER* | **898.6** | 3,847.7 | 2,890.6 | 2,963.4 | 3,406.8 | 4,137.8 | 6,310.7 | 8,573.8 | 9,320.9 | 8,915.7 | **8,719.0** | **8,510.9** | 847.1 | -2.4 |
| CIVILIAN AGENCIES TOTAL | **341,874.1** | 350,168.3 | 349,531.2 | 349,032.6 | 358,886.6 | 362,041.0 | 364,341.1 | 371,126.1 | 375,831.1 | 372,900.9 | **381,170.2** | **391,897.6** | 14.6 | 2.8 |
| DOD | **1,459,945.7** | 1,497,346.8 | 1,519,110.8 | 1,352,815.6 | 1,292,793.5 | 1,213,755.8 | 1,153,527.4 | 1,122,862.5 | 1,092,230.0 | 1,045,560.2 | **1,018,045.4** | **993,207.2** | -32.0 | -2.4 |
| ALL AGENCIES | **1,801,819.8** | 1,847,515.1 | 1,868,642.0 | 1,701,848.2 | 1,651,680.2 | 1,575,796.8 | 1,517,868.5 | 1,493,988.5 | 1,468,061.0 | 1,418,461.1 | **1,399,215.6** | **1,385,104.8** | -23.1 | -1.0 |
| MBOE | **309.3** | 317.2 | 320.8 | 292.2 | 283.6 | 270.5 | 260.6 | 256.5 | 252.0 | 243.5 | **240.2** | **237.8** | | |
| Petajoules | **1,900.9** | 1,949.1 | 1,971.3 | 1,795.4 | 1,742.5 | 1,662.4 | 1,601.3 | 1,576.1 | 1,548.8 | 1,496.4 | **1,476.1** | **1,461.2** | | |

DATA AS OF 11/30/01

*Other includes, for certain years, CFTC, CIA, EEOC, FEMA, FTC, NARA, NSF, NRC, OPM, RRB, SSA, USIA/IBB, and FERC.

[1]In 1998, the State Department developed a statistical method for estimating the energy consumption in the large number of foreign buildings it owns and leases. This method was subsequently applied to estimate FY 1991 energy consumption and is now used annually to assess progress. The FY 1991 foreign building estimates were combined with domestic building data for the fiscal years 1985 and 1990, since these are base years for performance goals.

[2]TVA's increase in energy consumption beginning in FY 1994 is the result of first-time reporting of energy consumed at generation sites.

Note: This table uses a conversion factor for electricity of 10,346 Btu per kilowatt hour and 1,390 Btu per pound of steam. Agencies are listed in descending order of consumption for the current year. Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

TABLE 1-B

TOTAL SITE-DELIVERED ENERGY CONSUMPTION BY FEDERAL AGENCIES

(In Billions of Btu, with Conversions to Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x $10^{15}$])

| CIVILIAN AGENCY | **FY 1985** | FY 1990 | FY 1991 | FY 1992 | FY 1993 | FY 1994 | FY 1995 | FY 1996 | FY 1997 | FY 1998 | **FY 1999** | **FY 2000** | %Change 85-00 | %Change 99-00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| USPS | **27,762.5** | 30,616.2 | 30,817.0 | 31,674.2 | 33,725.1 | 34,950.8 | 36,220.9 | 36,427.1 | 40,760.0 | 39,487.3 | **39,774.0** | **42,295.1** | 52.3 | 6.3 |
| DOE | **52,211.6** | 43,465.5 | 42,178.6 | 44,300.2 | 43,688.5 | 42,279.2 | 47,089.7 | 44,424.9 | 33,926.3 | 31,450.1 | **30,363.9** | **29,483.8** | -43.5 | -2.9 |
| VA | **25,144.7** | 24,898.4 | 25,050.4 | 25,254.9 | 25,741.2 | 25,587.8 | 25,428.9 | 26,832.9 | 27,261.1 | 27,597.2 | **27,472.4** | **26,994.9** | 7.4 | -1.7 |
| DOT | **19,568.1** | 18,965.2 | 18,971.4 | 17,027.3 | 19,360.1 | 19,772.6 | 18,652.3 | 19,564.1 | 19,125.8 | 18,509.9 | **20,508.1** | **20,380.1** | 4.1 | -0.6 |
| DOJ | **8,176.0** | 6,961.6 | 8,018.3 | 7,544.3 | 9,081.7 | 10,263.6 | 10,193.3 | 12,127.7 | 11,999.9 | 15,805.1 | **15,366.2** | **17,718.5** | 116.7 | 15.3 |
| GSA | **19,256.1** | 15,656.6 | 13,985.0 | 13,842.0 | 14,149.4 | 13,963.0 | 13,671.8 | 14,499.2 | 14,364.3 | 14,095.0 | **14,359.9** | **17,667.9** | -8.2 | 23.0 |
| NASA | **10,843.7** | 12,401.4 | 12,541.1 | 12,622.9 | 12,366.2 | 12,576.6 | 12,397.0 | 11,461.7 | 11,996.4 | 11,731.5 | **11,434.1** | **10,953.5** | 1.0 | -4.2 |
| USDA | **8,358.7** | 9,519.6 | 9,599.6 | 9,100.6 | 9,332.9 | 9,412.9 | 9,728.8 | 9,056.9 | 7,370.7 | 7,917.0 | **7,828.6** | **7,446.7** | -10.9 | -4.9 |
| HHS | **5,953.5** | 6,968.7 | 6,222.5 | 6,794.0 | 7,215.5 | 7,519.0 | 6,129.7 | 6,628.9 | 7,852.7 | 7,400.8 | **7,131.2** | **7,443.7** | 25.0 | 4.4 |
| DOI | **7,816.3** | 7,391.9 | 7,094.8 | 6,992.4 | 7,482.1 | 7,892.2 | 6,378.4 | 4,326.6 | 6,612.2 | 6,427.3 | **7,456.0** | **5,970.1** | -23.6 | -19.9 |
| TRSY | **2,868.3** | 3,576.4 | 4,177.1 | 4,628.4 | 4,912.7 | 4,558.2 | 4,132.6 | 3,764.1 | 4,597.6 | 4,816.3 | **4,899.4** | **4,780.6** | 66.7 | -2.4 |
| ST[1] | **2,771.7** | 2,827.4 | 2,799.0 | 273.8 | 390.2 | 422.3 | 437.3 | 653.3 | 3,278.0 | 3,258.4 | **3,368.6** | **3,207.6** | 15.7 | -4.8 |
| TVA [2] | **2,851.9** | 2,605.4 | 2,623.2 | 2,380.9 | 2,246.2 | 2,534.9 | 2,607.3 | 2,547.8 | 2,396.9 | 2,295.9 | **2,510.1** | **2,893.4** | 1.5 | 15.3 |
| DOL | **2,385.2** | 2,376.0 | 2,446.0 | 2,452.4 | 2,514.9 | 2,527.9 | 2,385.7 | 2,491.5 | 2,490.2 | 2,540.4 | **2,048.1** | **2,125.7** | -10.9 | 3.8 |
| DOC | **2,489.1** | 4,476.3 | 2,722.2 | 2,460.1 | 2,338.4 | 2,858.3 | 2,882.8 | 2,883.1 | 2,721.4 | 2,470.3 | **2,684.3** | **1,757.3** | -29.4 | -34.5 |
| EPA | **904.5** | 747.0 | 822.4 | 839.7 | 994.8 | 1,041.3 | 1,120.5 | 1,100.0 | 1,149.3 | 1,120.4 | **1,290.8** | **982.5** | 8.6 | -23.9 |
| HUD | **116.9** | 140.3 | 164.9 | 156.7 | 147.8 | 144.2 | 131.3 | 140.8 | 137.6 | 126.4 | **129.6** | **106.5** | -8.9 | -17.8 |
| FCC | **23.6** | 23.9 | 22.1 | 19.9 | 20.2 | 20.7 | 20.7 | 17.5 | 19.9 | 19.4 | **19.4** | **22.9** | -2.9 | 18.2 |
| PCC | **724.2** | 873.1 | 808.1 | 923.5 | 914.9 | 921.0 | 1,108.0 | 1,080.8 | 1,021.9 | 0.0 | **0.0** | **0.0** | -100.0 | N/A |
| OTHER* | **408.2** | 2,175.0 | 1,382.0 | 1,460.4 | 1,604.1 | 1,981.0 | 2,979.7 | 3,716.2 | 3,998.7 | 3,870.0 | **3,846.5** | **3,710.7** | 809.0 | -3.5 |
| CIVILIAN AGENCIES TOTAL | **200,635.1** | 196,665.8 | 192,445.6 | 190,748.5 | 198,226.8 | 201,227.6 | 203,696.8 | 203,745.2 | 203,080.8 | 200,938.6 | **202,491.5** | **205,941.7** | 2.6 | 1.7 |
| DOD | **1,250,613.8** | 1,241,655.8 | 1,269,291.5 | 1,103,990.1 | 1,048,772.9 | 977,040.4 | 926,022.9 | 904,150.2 | 880,007.7 | 837,115.8 | **810,663.0** | **774,546.8** | -38.1 | -4.5 |
| ALL AGENCIES | **1,451,248.9** | 1,438,321.7 | 1,461,737.1 | 1,294,738.6 | 1,246,999.8 | 1,178,268.0 | 1,129,719.7 | 1,107,895.4 | 1,083,088.5 | 1,038,054.4 | **1,013,154.5** | **980,488.5** | -32.4 | -3.2 |
| MBOE | **249.1** | 246.9 | 250.9 | 222.3 | 214.1 | 202.3 | 193.9 | 190.2 | 185.9 | 178.2 | **173.9** | **168.3** | | |
| Petajoules | **1,531.0** | 1,517.4 | 1,542.1 | 1,365.9 | 1,315.5 | 1,243.0 | 1,191.8 | 1,168.8 | 1,142.6 | 1,095.1 | **1,068.8** | **1,034.4** | | |

DATA AS OF 11/30/01

*Other includes, for certain years, CFTC, CIA, EEOC, FEMA, FTC, NARA, NSF, NRC, OPM, RRB, SSA, USIA/IBB, and FERC.

[1]In 1998, the State Department developed a statistical method for estimating the energy consumption in the large number of foreign buildings it owns and leases. This method was subsequently applied to estimate FY 1991 energy consumption and is now used annually to assess progress. The FY 1991 foreign building estimates were combined with domestic building data for the fiscal years 1985 and 1990, since these are base years for performance goals.

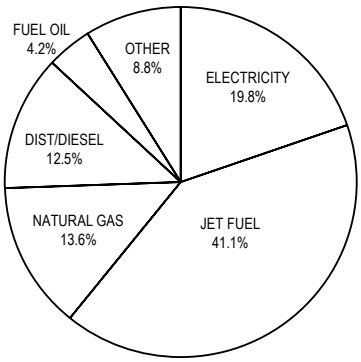
[2]TVA's increase in energy consumption beginning in FY 1994 is the result of first-time reporting of energy consumed at generation sites.

Note: This table uses a conversion factor for electricity of 3,412 Btu per kilowatt hour and 1,000 Btu per pound of steam. Agencies are listed in descending order of consumption for the current year. Sum of components may not equal total due to independent rounding.

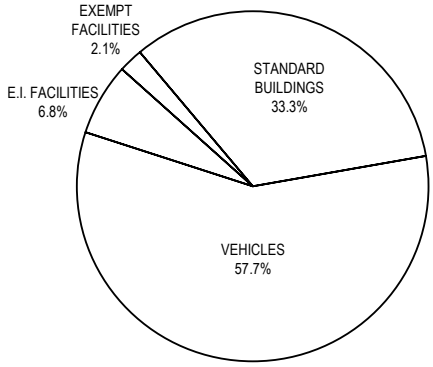
Source: Federal Agency Annual Energy Management Data Reports

**FIGURE 1**
**Federal Energy Consumption, FY 2000**

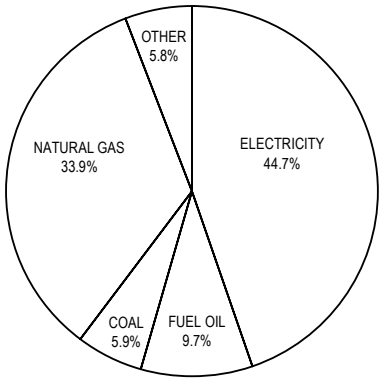
Total by Energy Type: 0.98 quads



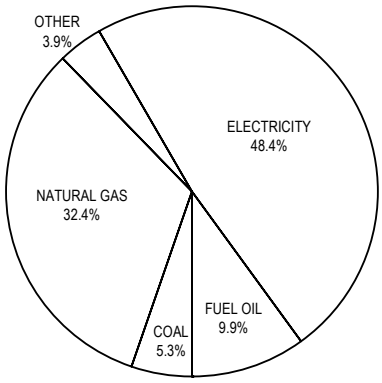

Total by Sector: 0.98 quads



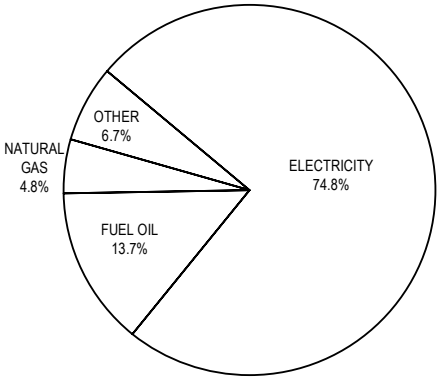

Standard Buildings: 0.33 quads



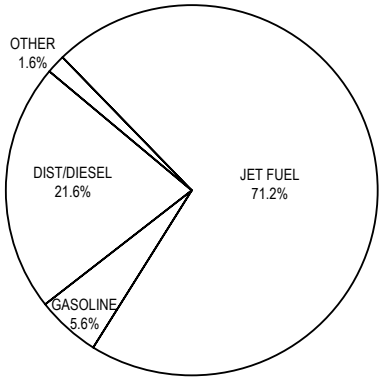

Energy Intensive Facilities: 0.07 quads




Exempt Facilities: 0.02 quads




Vehicles & Equipment: 0.57 quads

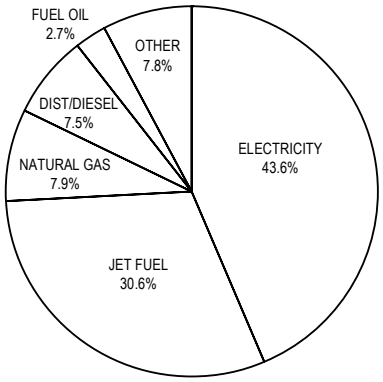



Data as of 11/30/01

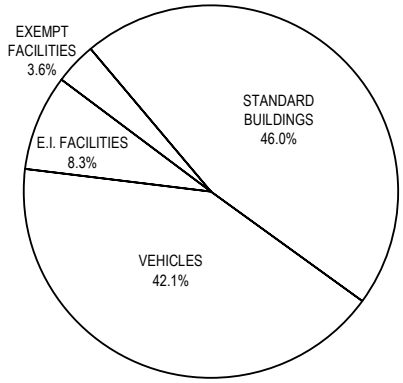
Source: Federal Agency Annual Energy Management Data Reports
Note: Sum of components may not equal 100 percent due to independent rounding.

**FIGURE 2**
**Federal Energy Costs, FY 2000**

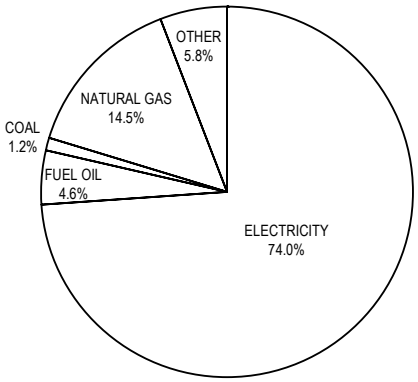
Total by Energy Type: $7.37 Billion



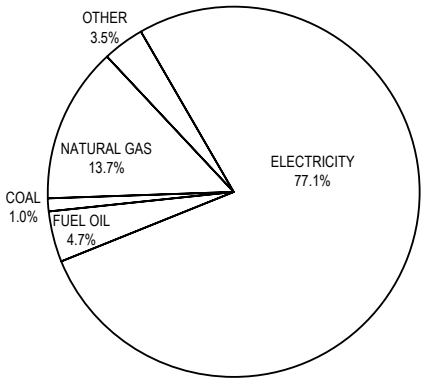

Total by Sector: $7.37 Billion



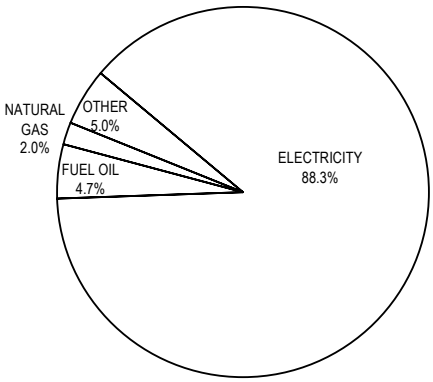

Standard Buildings: $3.39 Billion



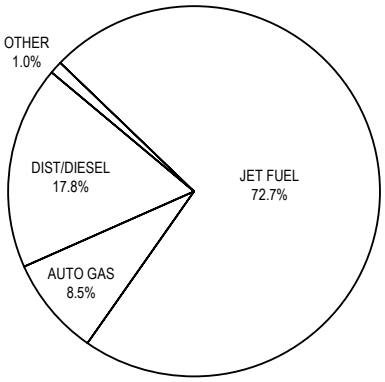

Energy Intensive Facilities: $0.61 Billion




Exempt Facilities: $0.26 Billion




Vehicles & Equipment: $3.10 Billion




Data as of 11/30/00

Source: Federal Agency Annual Energy Management Data Reports
Note: Sum of components may not equal 100 percent due to independent rounding.

Petroleum-based fuels used by the Federal Government are shown in Table 2. In FY 2000, petroleum-based fuels accounted for 0.61 quads (609,830.6 billion Btu) of the total 0.98 quads consumed by the Federal Government. Of that, approximately 0.56 quads (556,949.9 billion Btu) were used by the Department of Defense primarily for jet fuel and distillate/diesel for vehicles and equipment energy. Only 0.03 quads (33,996.2 billion Btu) of petroleum-based fuels were used for Federal buildings and facilities energy.

TABLE 2
FEDERAL PETROLEUM USAGE IN FY 2000
(in Thousands of Gallons, Billions of Btu,
and Petajoules [Joule x $10^{15}$])

| | Unit Total (KGal) | BBTU* DOD | BBTU* Civilian | BBTU* Total | Petajoules* Total |
|---|---|---|---|---|---|
| **Buildings & Facilities** | | | | | |
| Fuel Oil | 229,351.2 | 26,455.3 | 5,355.7 | 31,811.0 | 33.56 |
| LPG/Propane | 22,882.1 | 1,527.2 | 658.0 | 2,185.2 | 2.31 |
| **Energy Intensive Operations** | | | | | |
| Fuel Oil | 47,991.0 | 4,701.7 | 1,954.7 | 6,656.4 | 7.02 |
| LPG/Propane | 2,527.8 | 64.5 | 176.9 | 241.4 | 0.25 |
| **Exempt Buildings** | | | | | |
| Fuel Oil | 20,247.9 | 2,475.4 | 333.0 | 2,808.4 | 2.96 |
| LPG/Propane | 496.0 | 0.0 | 47.4 | 47.4 | 0.05 |
| **Vehicles & Equipment** | | | | | |
| Motor Gas | 255,091.5 | 9,357.9 | 22,528.6 | 31,886.4 | 33.64 |
| Dist-Diesel & Petrol. | 881,877.0 | 110,108.5 | 12,207.9 | 122,316.3 | 129.07 |
| Aviation Gas | 1,535.9 | 1.6 | 190.4 | 192.0 | 0.20 |
| Jet Fuel | 3,100,394.4 | 395,127.6 | 7,923.7 | 403,051.3 | 425.20 |
| Navy Special | 46,336.1 | 6,426.6 | 0.2 | 6,426.8 | 6.78 |
| LPG/Propane | 414.9 | 23.2 | 16.5 | 39.6 | 0.04 |
| Other | 2,168.4 | 680.4 | 1,488.0 | 2,168.4 | 2.29 |
| Total | | 556,949.9 | 52,880.8 | 609,830.6 | 643.30 |

DATA AS OF 11/30/01

*Uses a conversion factor of:

95,500 Btu/gallon for LPG/propane
138,700 Btu/gallon for fuel oil, distillate-diesel & petroleum, and navy special
125,000 Btu/gallon for motor gasoline and aviation gasoline
130,000 Btu/gallon for jet fuel
947.9 Billion Btu/Petajoule

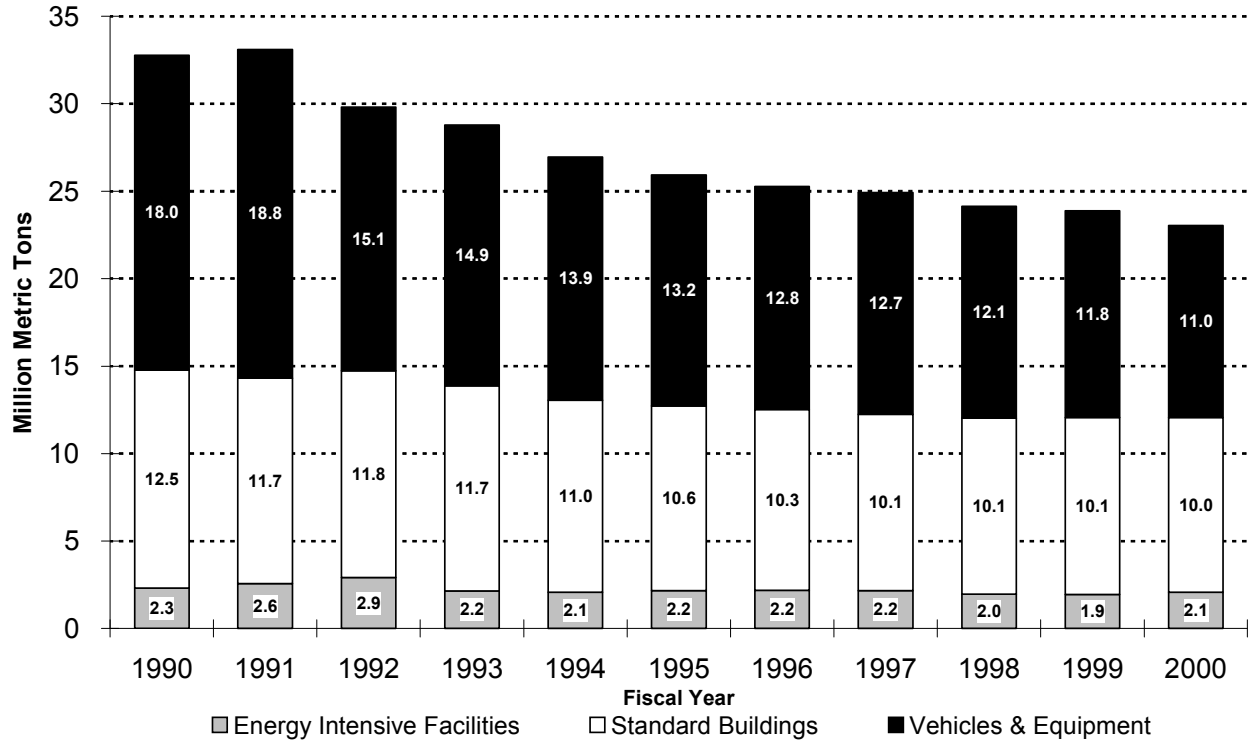
Note: FY 2000 contains estimated data for the following agencies: EEOC, NSF, OPM, IBB.
Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

Carbon emissions from Federal Government energy consumption have decreased significantly since FY 1990. As shown in Figure 3, the Federal Government has reduced carbon emissions across the three non-exempt end-use sectors by 29.7 percent from 32.8 million metric tons of carbon equivalent (MMTCE) in FY 1990 to 23.0 MMTCE in FY 2000.[11] The largest contribution to this reduction is from the vehicles and equipment sector, which has seen a decrease in carbon emissions of 39.0 percent. This is a result of a reduction of almost 6.4 MMTCE emissions from jet fuel, as well as smaller reductions from diesel, aviation gasoline, navy special (a residual fuel oil), and LPG/propane.

Carbon emissions have decreased by 19.9 percent in the standard buildings sector since 1990. Contributing to this reduction was a 9.2 percent reduction in gross square footage since FY 1990 and an 8.3 percent decrease in primary energy intensity (224,244 Btu/GSF in FY 1990, 205,657 Btu/GSF in FY 2000). Carbon emissions from energy intensive activities in industrial, laboratory, and other buildings decreased 10.0 percent (0.2 million metric tons) since FY 1990.

**FIGURE 3**
**Carbon Emissions from Federal Energy Consumption, FY 1990 through FY 2000**
**(Million Metric Tons of Carbon Equivalent [MMTCE])**




[11]Carbon emissions were calculated by multiplying energy consumption for each fuel type by an associated carbon coefficient shown in Appendix B.

Section 201 of Executive Order 13123 establishes a greenhouse gas reduction goal for Federal Government facilities. This goal applies to standard buildings subject to the energy efficiency goals of Section 202 and industrial, laboratory, and other energy-intensive facilities subject to the goals of Section 203. The requirement states:

> "Through life-cycle cost-effective energy measures, each agency shall reduce its greenhouse gas emissions attributed to facility energy use by 30 percent by 2010 compared to such emissions levels in 1990. In order to encourage optimal investment in energy improvements, agencies can count greenhouse gas reductions from improvements in nonfacility energy use toward this goal to the extent that these reductions are approved by the Office of Management and Budget (OMB)."

As shown in Table 3, when the carbon emissions from non-exempt facilities are combined, the Government shows a reduction of 18.4 percent from 14.8 MMTCE in FY 1990 to 12.0 MMTCE in FY 2000.

Carbon emission calculations were adjusted in FY 2000 for eight agencies to reflect purchases of renewable energy. These agencies, and their corresponding credit for renewable energy purchases are shown below:

| Agency | MTCE |
|---|---|
| Department of Defense | 54,230 |
| U.S. Postal Service | 581 |
| Environmental Protection Agency | 244 |
| Department of Agriculture | 148 |
| General Services Administration | 122 |
| Department of the Interior | 56 |
| Department of Energy | 39 |
| Tennessee Valley Authority | 24 |
| TOTAL | 55,444 |

TABLE 3
CARBON EMISSIONS FROM FEDERAL AGENCY FACILITY ENERGY USE
(In Metric Tons of Carbon Equivalent [MTCE])

| CIVILIAN AGENCY | **FY 1990** | FY 1991 | FY 1992 | FY 1993 | FY 1994 | FY 1995 | FY 1996 | FY 1997 | FY 1998 | **FY 1999** | **FY 2000** | %CHANGE 90-00 | %CHANGE 99-00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| USPS | **687,516** | 704,295 | 729,898 | 786,519 | 764,341 | 781,885 | 805,984 | 724,512 | 772,307 | **784,284** | **893,086 †** | 29.9 | 13.9 |
| DOE | **1,121,485** | 1,061,910 | 1,085,728 | 1,050,971 | 1,053,982 | 1,165,049 | 1,128,630 | 1,085,002 | 872,272 | **890,693** | **872,080 †** | -22.2 | -2.1 |
| VA | **665,288** | 676,624 | 676,063 | 688,980 | 674,610 | 678,289 | 702,452 | 701,307 | 709,187 | **712,775** | **712,680** | 7.1 | -0.01 |
| GSA | **576,465** | 547,107 | 538,150 | 548,957 | 510,255 | 500,452 | 523,980 | 522,925 | 531,401 | **547,685** | **587,494 †** | 1.9 | 7.3 |
| DOJ | **151,026** | 192,962 | 150,733 | 190,656 | 200,586 | 211,621 | 258,891 | 257,427 | 266,555 | **276,209** | **315,577** | 109.0 | 14.3 |
| NASA | **274,477** | 273,938 | 275,950 | 270,484 | 265,557 | 265,204 | 257,278 | 263,394 | 272,023 | **267,788** | **262,477** | -4.4 | -2.0 |
| HHS | **218,216** | 194,929 | 213,473 | 222,189 | 212,968 | 183,414 | 197,046 | 217,171 | 217,720 | **214,647** | **228,784** | 4.8 | 6.6 |
| ST | **123,002** | 123,473 | 14,909 | 20,906 | 21,674 | 22,485 | 32,063 | 138,798 | 143,034 | **137,521** | **138,912** | 12.9 | 1.0 |
| USDA | **140,752** | 137,793 | 131,456 | 138,104 | 130,495 | 129,733 | 133,786 | 127,553 | 135,547 | **128,569** | **128,611 †** | -8.6 | 0.03 |
| DOI | **124,663** | 127,882 | 113,716 | 138,001 | 128,478 | 119,447 | 96,585 | 109,071 | 112,139 | **112,460** | **123,058 †** | -1.3 | 9.4 |
| DOT | **105,548** | 97,026 | 121,017 | 121,993 | 111,813 | 121,939 | 120,961 | 124,863 | 116,034 | **119,772** | **117,097** | 10.9 | -2.2 |
| TRSY | **78,782** | 91,364 | 98,735 | 88,342 | 87,311 | 82,611 | 81,572 | 105,194 | 94,436 | **97,038** | **101,072** | 28.3 | 4.2 |
| TVA | **96,751** | 95,029 | 89,714 | 81,503 | 96,625 | 96,462 | 91,542 | 90,356 | 88,239 | **98,827** | **98,101 †** | 1.4 | -0.7 |
| DOL | **65,669** | 64,182 | 64,748 | 66,957 | 64,930 | 62,918 | 64,636 | 65,211 | 66,983 | **51,838** | **69,856** | 6.4 | 34.8 |
| DOC | **46,893** | 46,471 | 49,502 | 52,605 | 60,615 | 67,454 | 68,680 | 58,832 | 59,906 | **62,301** | **57,017** | 21.6 | -8.5 |
| EPA | **25,722** | 28,371 | 28,882 | 30,197 | 29,870 | 32,525 | 32,132 | 31,698 | 32,765 | **35,925** | **30,008 †** | 16.7 | -16.5 |
| NARA | **3,491** | 3,495 | 3,733 | 10,170 | 17,572 | 20,791 | 17,054 | 18,131 | 18,029 | **18,219** | **17,378** | 397.8 | -4.6 |
| USIA/IBB | **32,969** | 22,302 | 21,848 | 21,202 | 19,846 | 20,894 | 22,378 | 26,267 | 24,571 | **22,420** | **22,429** | -32.0 | 0.0 |
| FEMA | **7,623** | 7,245 | 7,358 | 6,698 | 6,107 | 6,107 | 6,106 | 6,107 | 6,368 | **6,609** | **6,571** | -13.8 | -0.6 |
| HUD | **6,347** | 6,072 | 5,629 | 5,229 | 4,677 | 4,415 | 4,768 | 4,540 | 4,544 | **4,680** | **4,680** | -26.3 | 0.0 |
| NRC | **1,861** | 2,891 | 2,559 | 2,607 | 2,575 | 3,408 | 3,648 | 3,791 | 3,934 | **4,007** | **3,801** | 104.3 | -5.1 |
| OPM | **3,221** | 3,377 | 3,461 | 3,727 | 3,491 | 3,491 | 3,490 | 3,491 | 3,654 | **4,357** | **3,206** | -0.5 | -26.4 |
| FTC | **997** | 986 | 976 | 960 | 903 | 903 | 903 | 903 | 943 | **968** | **1,246** | 25.0 | 28.8 |
| RRB | **1,368** | 1,438 | 1,582 | 1,532 | 1,493 | 1,460 | 1,420 | 1,448 | 1,276 | **1,203** | **1,136** | -16.9 | -5.6 |
| FCC | **586** | 619 | 483 | 501 | 521 | 521 | 426 | 426 | 441 | **442** | **426** | -27.3 | -3.6 |
| Other* | **20,089** | 11,012 | 10,614 | 10,902 | 10,089 | 37,245 | 72,535 | 75,500 | 63,802 | **65,069** | **65,672** | 226.9 | 0.9 |
| Civilian Agencies Total | **4,580,806** | 4,522,791 | 4,440,918 | 4,560,894 | 4,481,385 | 4,620,724 | 4,728,946 | 4,763,918 | 4,618,110 | **4,666,306** | **4,862,455 †** | 6.1 | 4.2 |
| DOD | **10,184,471** | 9,788,747 | 10,286,884 | 9,312,036 | 8,555,023 | 8,091,409 | 7,788,012 | 7,481,295 | 7,418,175 | **7,394,256** | **7,192,174 †** | -29.4 | -2.7 |
| Total | **14,765,277** | 14,311,539 | 14,727,802 | 13,872,930 | 13,036,409 | 12,712,133 | 12,516,958 | 12,245,213 | 12,036,285 | **12,060,562** | **12,054,629 †** | -18.4 | -0.05 |

*Other includes, for certain years, CFTC, CIA, NSF, PCC, and SSA.
DATA AS OF 11/30/01
†Indicates where adjustments were made to reflect purchases of renewable energy.
Note: Sum of components may not equal total due to independent rounding.
Source: Calculated from energy consumption data from Federal Agency Annual Energy Management Data Reports, see Appendix B.

## C. Energy Management Infrastructure and Tools

### 1. Federal Coordination

*Federal Interagency Energy Policy Committee (656 Committee)*
The Federal Interagency Energy Policy Committee (656 Committee) was established in accordance with Section 656 of the Department of Energy Organization Act (P.L. 95-91) to strengthen Government programs that emphasize productivity through the efficient use of energy, and concurrently, to encourage interagency cooperation in energy conservation. At the Committee's January 24, 2000 meeting, the following items were discussed:

- The U.S. Army's initiative to utilize wind-generated electricity at Fort Bliss in Texas.

- Executive Order 13123 requirements pertaining to sustainable design principles to be applied by agencies when siting, designing, and constructing new facilities.

- The General Services Administration's activities (required under Executive Order 13123) in developing model lease provisions for ensuring energy efficiency in space leased by the Federal Government.

- The Environmental Protection Agency's efforts in green power purchasing, including the purchase of 100 percent green power for its laboratory in Richmond, California.

- The Green Energy Parks Initiative partnership between DOE and the Interior Department, which will present the 250 National Parks and wildlife reserves as models of efficiency and environmental preservation.

- FEMP's efforts to develop a comprehensive interagency agreement that can be used to access any of FEMP's services, including ESPC and utility financing support, energy audits, and design assistance.

*Federal Interagency Energy Management Task Force*
The Federal Interagency Energy Management Task Force (Task Force) was established in accordance with the Federal Energy Management Improvement Act of 1988 to stimulate increased energy efficiency in the Federal sector. The Task Force serves as technical advisor to the 656 Committee by coordinating the activities of the Federal Government in promoting energy conservation and the efficient use of energy.

The Director of FEMP serves as the Executive Director of the Task Force. The Task Force, composed of the chief energy managers of the agencies represented on the 656 Committee, addresses energy issues affecting Federal facilities and operations and provides the 656 Committee with in-depth analysis and recommendations concerning current and pending legislation, technical issues, and implementation of coordinated Federal activities.

The Task Force assesses the progress of agencies toward achieving energy savings, and collects and disseminates information on effective survey techniques, technologies that promote

conservation and efficient use of energy, and innovative programs and contracting methods. To accomplish its mission, the Task Force establishes working groups to resolve specific technical or programmatic issues, to develop new initiatives for Federal implementation, and to address legislative requirements and topics presented by the 656 Committee, the Executive Director, or member agencies.

In FY 2000, meetings of the Task Force were held on November 10, 1999; January 12, 2000; May 10, 2000; and July 10, 2000. Issues highlighted in the these meetings included the following:

- The Federal Commercial Building Energy Standard (FEDCOM).
- A draft Combined Heat and Power Plan developed by FEMP.
- *You Have the Power* energy awareness campaign.
- Utility metering and billing issues and how they affect Federal agencies.
- Executive Order 13123, including numerous reports from Task Force working groups implementing provisions of the Order.
- Aggregation of agency electricity purchases and green power issues.
- Federal participation in DOE's Wind Powering America program.
- Executive Orders 13148, 13149, and 13150.
- Guidance for completing annual reports, complying with Executive Order 13123, and water efficiency improvements at Federal facilities.

*Senior Energy Officials*
Section 304 of Executive Order 13123, states that "Each agency shall designate a senior official, at the Assistant Secretary level or above, to be responsible for meeting the goals and requirements of this order, including preparing the annual report to the President. Designated officials shall participate in the Interagency Energy Policy Committee. . . [and] shall communicate its activities to all designated officials to assure proper coordination and achievement of the goals and requirements of this order."

A meeting of the Senior Energy Officials was convened and chaired by OMB on October 13, 2000. Energy Manager Paul Allen, Walt Disney Company, talked about how Disney manages its energy consumption through internal metering, competitions among its hotels and parks, and distributing mock bills to their facilities. The Senior Vice President for Environmental Policy also spoke and showed a helpful video featuring energy saving tips. The Senior Officials were very interested in how the private sector manages its energy consumption.

## 2. Training

Many agencies have their own internal training and recognition programs. These are discussed individually in Section VI of this report. Overall, Federal agencies reported spending $2.5 million to train 9,220 Federal personnel in energy efficiency, renewable energy, and water conservation subjects, including energy efficient product procurement and alterative financing techniques for energy and water projects.

During FY 2000, FEMP conducted 59 training workshops and symposia for more than 5,353 attendees in the efficient use and conservation of energy, water, and renewable energy in Federal facilities.

FEMP supplemented its classroom workshops with "distance learning" training, via satellite. The Energy Management Teleworkshop, a 10-module survey of FEMP courses, attracted 2,836 viewers. It included modules for life-cycle costing; buying energy efficient products; water resource management; operations and maintenance management; financing; and, engineering.

Eight workshops on energy savings performance contracting were conducted in FY 2000 for 207 participants. In each workshop, facility managers, contract specialists, and building engineers were instructed on the statutory provisions for this innovative contracting/financial method, and how to identify suitable projects. ESPCs allow energy-efficient improvements to be installed by private contractors with no up-front capital costs.

FEMP's Utility Project Financing/Utility Restructuring workshop was presented 6 times for 203 students.

The Designing Low Energy Buildings course was presented twice for 56 participants. The two-day course included analyses and case studies of building design using passive solar heating, natural ventilation and cooling, and day lighting, as well as glazing and overhangs.

The FEMP Lights course was conducted twice for a total of 36 participants. The objective was to provide guidance on energy-efficient lighting consistent with other facility lighting considerations, quality and cost, and whole building analysis. Topics included: basic lighting concepts; a comprehensive process for Federal relighting project development and implementation; and the use of professional lighting design services.

Two Facility Energy Decision Screening (FEDS) workshops were held during FY 2000 for 36 attendees. This is a training course for Federal facility managers on whole-site analysis of energy conservation, technical, and financial opportunities utilizing the FEDS project screening software and the project implementation software.

The Operations and Maintenance Management classroom course was presented once for 25 students.

FEMP, in conjunction with the National Institute of Standards and Technology, conducted 2 workshops on life-cycle costing and building retrofit simulation for 63 students.

The Implementing Renewable Energy Projects course was presented twice for 69 students.

FEMP continued to offer its Water Resource Management course with two workshops for 30 attendees in FY 2000. The course is designed to assist Federal site managers and agencies in meeting the water conservation requirements of Energy Policy Act of 1992 (EPACT) and Executive Order 12902.

During FY 2000, FEMP participated in the organization and presentation of 24 panel discussions on Federal energy efficiency, water conservation, and renewable energy topics at national energy management conferences around the country, attracting 1,916 attendees.

"Energy 2000," the energy efficiency workshop and exposition sponsored by FEMP, Department of Defense, and General Services Administration was held August 21-23, 2000, in Pittsburgh, Pennsylvania. The conference provided participants with opportunities to explore such topics as strategies for energy projects, selling energy projects, and alternative financing. The conference also had panel discussions, an exhibit hall showcasing energy technologies, and chances for relationship building.

FEMP continued to offer its Training Course Locator System to assist Federal agencies in training energy managers and in meeting the requirements of the EPACT. The Locator System connects those seeking particular training courses with the sponsoring organizations for those courses. During FY 2000, FEMP implemented significant improvements to the Locator system. Locator was upgraded to a Web-based application which is readily available to through the Internet. During August and September 2000, more than 100 unique visitors to Locator viewed 1,647 pages from the Locator Web site.

### 3. Awards and Recognition

*Federal Energy and Water Management Awards*
Outstanding accomplishments in energy efficiency and water conservation in the Federal sector were recognized with the presentation of the 2000 Federal Energy and Water Management Awards on October 12, 2000, in Washington, D.C. The Awards Program is sponsored by the 656 Committee and the Department of Energy. Awards were selected from outstanding Federal energy managers and contributors who:

- Implemented proven energy efficiency, energy and water conservation techniques;
- Developed and implemented energy-related training programs and employee energy awareness programs;
- Succeeded in receiving utility incentives, or awarding ESPC and other Federal-approved performance-based energy and water contracts;
- Made successful efforts to fulfill compliance with energy and water reduction mandates;
- Improved energy efficiency or reduction in energy costs for Federal mobile equipment including aircrafts, ships, and vehicles;
- Improved tracking of energy consumption, costs and energy efficient investments;

- Provided leadership in purchasing or supplying energy-efficient, renewable energy or water-conserving products to one or more Federal agencies; and
- Demonstrated cost-beneficial landscape practices which utilize techniques that seek to minimize the adverse effects of landscaping.

Recipients of the 2000 awards were selected from 145 nominees submitted by 17 Federal agencies. Award recipients totaled 43, representing 12 different Federal agencies. Distribution of awards among the Federal agencies for accomplishments in FY 2000 is indicated below. Awards were presented to agencies in the categories shown in the exhibit below:

| **Agency** | Individual | Small Group | Organization | **Total** | Energy Efficiency | Alternative Financing | Renewable Energy | Mobility | Water Mgmt. | Innovative Tech. | Exceptional Service |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Army | 1 | 3 | 6 | 10 | 4 | 2 | 1 | | 1 | 1 | 1 |
| Navy | | 2 | 5 | 7 | 2 | | 2 | 2 | | | 1 |
| USAF | | 2 | 2 | 4 | | 1 | | | 2 | | 1 |
| AUTEC | | | 1 | 1 | 1 | | | | | | |
| DOD | 1 | | | 1 | | | | | | | 1 |
| DOE | | 2 | | 2 | 2 | | | | | | |
| Interior | 1 | | 2 | 3 | | | | | 2 | | 1 |
| GSA | | 3 | 4 | 7 | 2 | 1 | 1 | | | 3 | |
| HHS | 1 | | | 1 | | | | | | | 1 |
| NASA | 2 | | | 2 | | 1 | | | | | 1 |
| NIH | 1 | | | 1 | | | | | | | 1 |
| USPS | 1 | | 3 | 4 | 1 | | | | | 2 | 1 |
| **TOTAL** | **8** | **12** | **23** | **43** | **12** | **5** | **4** | **2** | **5** | **6** | **9** |

Each category contained a wide variety of projects. Examples from each award category follow.

***Energy Efficiency Award to Organization:***
*Atlantic Undersea Test and Evaluation Center.* The Atlantic Undersea Test and Evaluation Center (AUTEC), on Andros Island, Bahamas, implemented a "Green Island" Program to conserve natural resources and reduce all forms of pollution. AUTEC installed solar water heaters on a new barracks equipped with energy-efficient lighting and appliances. The solar water heaters will save an estimated $8,000 annually. The National Renewable Energy Laboratory and the DOE also selected AUTEC as a "Million Solar Roofs Program" site, awarding AUTEC a $75,000 grant to install additional state-of-the-art solar water heaters. Photovoltaic perimeter lighting was installed in 1999 at a cost per unit of $2,500, plus $500 for installation. Over the 12-year projected life of each unit, annual cost savings are $500 per unit. AUTEC volunteered to evaluate battery-powered Chevy S-10 pickups for the Naval Facilities Engineering Service Center, and ordered eight of them at no cost. The eight electric pickups are projected to save $1,700 each year in fuel costs. In addition to the trucks, AUTEC uses a variety of battery-operated vehicles, such as two- and four-seater golf carts. The total energy cost saved by AUTEC was $177,596 and more than 32 billion Btu.

***Energy Efficiency Award to Small Group:***
*Environmental Technology Building and Energy and Environmental Sciences Building Recommissioning Project, Pacific Northwest National Laboratory.* The Environmental Technology Building (ETB) and Energy and Environmental Sciences Building (EESB) Recommissioning Project led to significantly improved occupant comfort and reduced energy costs in the ETB and the EESB Buildings on the Pacific Northwest National Laboratory (PNNL) campus. Before the recommissioning, occupants complained of poor heating, cooling, and drafts. Also, energy use was high with ETB, which used 40 percent more energy in 1998 than in 1995. PNNL's team carefully designed and implemented a 3-week controlled test of the buildings' energy performance. This required returning the buildings' energy management control systems to their original, "as-designed" operating strategy and set points. After adjustments were made to erroneous settings, the improvements in occupant comfort and building energy performance were significant and immediate. The cost savings in electricity was an estimated $95,000 and 11 billion Btu.

***Alternative Financing Award:***
*Dennis M. Klekar, Johnson Space Center, National Aeronautics and Space Administration.* Mr. Klekar was the initiator and champion of the energy savings performance contract awarded at NASA Johnson Space Center. He has worked tenaciously since 1994 to implement an energy savings contract at the Center and saw the project through its evolution from an attempted shared energy savings contract, a combined Base Operations Support Services/ESPC contract and finally through to a Regional Super ESPC delivery order. The delivery order, valued at approximately $43 million over its 23-year term, was issued to Honeywell, Inc., through DOE's Central Regional Super ESPC. It includes installing energy-efficient lighting and compressed air systems, variable speed pumping systems, cooling tower control systems, reducing water consumption and improving HVAC controls at the Johnson Space Center, the Sonny Carter Training Facility, and Ellington Field. Additionally, an advanced energy management system will be installed that will further enhance NASA's ability to cost-effectively monitor and manage the site environment, and improve comfort for NASA personnel. The savings reaped from this project will pay for the cost of the system replacement, about $20 million, with no cost to the taxpayer. Once the project is completed in May 2000, Johnson Space Center is guaranteed to save more than $1.7 million in energy and water costs and $340,000 in maintenance savings per year.

***Renewable Energy Award:***
*GSA New England Region, General Services Administration.* The GSA New England Region has implemented a project that has proven to be a significant step forward in the goal to make renewable power sources a part of every day building operations. GSA partnered with FEMP to install one of the nation's largest solar arrays at the John F. Williams Federal Building in downtown Boston. This project has also substantially contributed to the President's Million Solar Roof Initiative. Phase I included the building integrated photovoltaics system, with approximately 4,000 square feet of roof surface covered by solar panels. The system will result in an annual estimated energy savings of 28 megawatt-hours. Phase II will include the replacement of two 100-ton chillers with chillers that use non-chlorofluorocarbon-based refrigerants; the retrofit of fans, motors, and lighting; the substitution of high-priced district steam for "in-house"

gas-fired boilers; and the installation of two 75 kilowatt cogeneration units to decrease the facility's utility bills.

***Mobility Energy Management Award:***
*Fleet Logistics Support Squadron Fifty-Eight, Department of the Navy.* Comprehensive energy savings measures have been undertaken in Support Squadron Fifty-Eight (VR-58). Through innovative ideas solicited from the entire chain of command, efficient operational planning, and the command's commitment to energy conservation, the Squadron achieved a 15 percent savings in aircraft fuel consumption. This reduction represents more than $1 million in annual cost savings, compared to the FY 1995 baseline. This achievement also surpasses the Chief of Naval Operations goal of 5 percent reduction by FY 2000. Administrative vehicle use was reduced 25 percent by consolidating runs, resulting in reduced fuel consumption. In addition, 30 percent of all Squadron spaces have been fitted with motion sensors and 10 percent of passageways are now using energy-efficient lighting fixtures. Through these efforts, VR-58 achieved a total energy cost savings of more than $1 million.

***Water Management Award:***
*Mora National Fish Hatchery & Technology Center, United States Department of the Interior.*
The Mora National Fish Hatchery and Technology Center has incorporated extensive water reuse facilities and sophisticated water recycling systems into its hatchery design. Water savings due to innovative, state-of-the-art water reuse systems will be approximately 2.2 billion gallons per year, based on a remarkable water reuse rate of 95 percent. Cost savings for the water reuse system are estimated at $9.3 million annually, after operations and maintenance costs. Engineering design of the final phase is currently 70 percent complete and will include a visitor center with displays that will describe the various water conservation systems in the hatchery building. These displays will help to educate the public about both the environmental and financial benefits of water efficiency measures. The Mora National Fish Hatchery and Technology Center's efforts to make water conservation a priority in its operation and maintenance will enhance the Department of the Interior's reputation as a Government leader in innovative water conservation technologies.

***Exceptional Service Award:***
*Frank Kutlak, Department of Health and Human Services, National Institutes of Health.* Mr. Kutlak is managing a $93 million budget to design and construct a state-of-the-art laboratory facility, known as Building 50, on the National Institutes of Health Bethesda Campus in Bethesda, Maryland. Building 50's design employs the latest energy saving technologies and will consume roughly 40 percent less energy than a comparable, standard design laboratory. For project construction, Mr. Kutlak reviewed bids based on contractors that were of the "best value" to the Government, not necessarily the "lowest cost." Even through this strategy, the standard appropriated budget had hardly been used and therefore, enough funding remained to build an additional floor to the laboratory. The project also received a $2 million utility rebate to the Government. To keep others up-to-date on the project developments, Mr. Kutlak developed a Web site on the design and construction of Building 50 and established a list serve to provide E-mail updates on the construction. Mr. Kutlak's devotion to this project, from formulating the design team to obtaining management approval, to the creation of an energy-efficient and

environmentally-sound building has resulted in the recognition of Building 50 as a state-of-the-art energy-efficient laboratory.

***Innovative Technology Award:***
*Rodeo Post Office, United States Postal Service/Lawrence Berkeley National Laboratory.* Using a new integrated lighting technology developed by the Lawrence Berkeley National Laboratory, the Rodeo Post Office has achieved more than 50 percent savings in energy for lighting, while greatly improving the lighting quality in letter sorting areas. This new unified system approach integrated a unique high efficiency task light, a low glare ambient lighting system, and lighting controls. Surveys of the letter carriers showed an increased level of satisfaction with the new lighting, demonstrating the value of coupling lighting quality with energy efficiency. In FY 1999, the installation of this integrated system resulted in a 71 percent reduction in the total load, a total energy cost savings of $3,500, and a Btu savings of 34,000 kilowatt-hours.

*Presidential Awards for Federal Energy Management Success*
On October 20, 2000, the White House honored four Federal agency energy management teams and more than 30 Federal employee participants of these teams for their support, leadership, and efforts in promoting and improving Federal energy management, and thereby saving millions of dollars in energy costs.

The Presidential Awards for Federal Energy Management Success were presented for the first time as required by Executive Order 13123, Greening the Government through Efficient Energy Management. Winners included representatives from the Environmental Protection Agency, the Department of State – Office of Foreign Building Operations, the Department of the Interior's National Park Service, along with the Department of Energy and the U.S. Army Energy Team. Award recipients were recommended to the President by the Office of Management and Budget and FEMP.

Award winners were as follows:

| | |
|---|---|
| *Implementation:* | Environmental Protection Agency, Architecture, Engineering, and Real Estate Branch |
| *Institutionalization:* | Department of State, Office of Foreign Buildings Operations |
| *Outreach:* | Department of the Interior/Department of Energy, Green Parks Initiative |
| *Results:* | U.S. Army, Energy Team |

## 4. Federal Energy Saver Showcase Facilities

To promote wise energy and water use throughout the Federal government, agencies are showcasing cost-effective energy efficiency, water-conserving, and renewable energy technologies in their facilities.

To highlight these successful energy efficiency projects, Executive Order 13123 requires that agencies designate "exemplary new and existing facilities with significant public access and exposure as showcase facilities to highlight energy or water efficiency and renewable energy improvements." The showcase program functions as a management strategy by assisting agencies

in implementing the goals of EO 13123. When facilities are designated as showcases, agencies can receive assistance from the Federal Energy Management Program and have the advantage of partnering with other agencies, energy services companies, utilities, and national laboratories.

Since 1995, FEMP has recognized more than 80 sites across the country as Federal Energy Saver Showcases. Each showcase site prominently displays a plaque notifying visitors that the Government building they are entering uses energy and water, as well as taxpayer dollars, wisely. A call for nominations has been distributed to urge agencies to identify and designate their best projects, or potential projects, so that others may benefit by example.

## 5. Energy Awareness

The Federal Government, as the largest single employer in the United States, has the responsibility to set an example for the nation by conducting energy awareness programs. Most agencies have ridesharing, carpooling, and/or public transportation programs in effect. Many agencies also participate in recycling programs. The following exhibit shows the employee awareness activities at the various Federal agencies.

| Agency | Award Programs | Recycling | Ridesharing | Transit Subsidies | Information Dissemination |
|---|---|---|---|---|---|
| USDA | ✓ | ✓ | ✓ | | ✓ |
| DOC | ✓ | ✓ | ✓ | | |
| DOD | ✓ | ✓ | ✓ | ✓ | ✓ |
| DOE | ✓ | ✓ | ✓ | ✓ | ✓ |
| HHS | ✓ | ✓ | ✓ | ✓ | ✓ |
| HUD | ✓ | ✓ | ✓ | ✓ | |
| DOI | ✓ | ✓ | ✓ | ✓ | ✓ |
| DOJ | ✓ | ✓ | ✓ | ✓ | ✓ |
| DOL | ✓ | ✓ | ✓ | ✓ | ✓ |
| ST | | ✓ | ✓ | | |
| DOT | ✓ | ✓ | ✓ | ✓ | ✓ |
| TRSY | | ✓ | ✓ | ✓ | ✓ |
| VA | | ✓ | | | |
| EPA | ✓ | ✓ | ✓ | ✓ | ✓ |
| GSA | ✓ | ✓ | ✓ | | |
| NASA | ✓ | ✓ | ✓ | ✓ | ✓ |
| NARA | ✓ | | | | |
| NRC | | ✓ | ✓ | ✓ | ✓ |
| RRB | | ✓ | | ✓ | |
| SSA | ✓ | ✓ | ✓ | ✓ | ✓ |
| TVA | | ✓ | ✓ | | ✓ |
| USPS | ✓ | ✓ | ✓ | | ✓ |

## 6. Public Education Programs

NECPA, 42 U.S.C. § 8258(b), requires the Secretary of Energy to include in this and subsequent annual reports information on public education programs carried out by Federal agencies and previously reported under the authority of section 381 of the Energy Policy and Conservation Act (EPCA), 42 U.S.C. § 6361(b). EPCA requires the Secretary of Energy to establish and carry out public education programs to encourage energy conservation and energy efficiency and to promote vanpooling and carpooling arrangements. The Department of Transportation (DOT) has promoted ride sharing activities, while DOE has been responsible for other energy conservation education programs.

Through its Federal Highway Administration, DOT obligates Federal aid funds to assist State and local agencies in implementing programs designed to encourage the use of car pools, van pools, and buses by commuters. DOT efforts have included van pool acquisition programs, fringe and corridor parking facilities, ride-matching projects, preferential treatments for high occupancy vehicles, and transit service improvement. Since 1974, more than $875 million in Federal aid highway funds have been spent on such projects in an effort to establish self-sufficient programs across the Nation.

The Department of Transportation's Technology Sharing Program (TSP) makes high quality reports in a user-friendly format available to the non-scientist or technical person to understand and act on transportation problems of state and local governments. This low-cost program disseminates technical reports on a variety of topics to this user community, thus saving them the time and cost of researching the information on an individual basis, or not having the information at all. The TSP products consist of reports, manuals, and summary documents which can be ordered at the following Internet site: http://www.tsp.dot.gov. Subjects include commuter issues and travel demand, traffic congestion, land-use development, and risk assessment.

DOE's public education programs encompass a wide variety of services, objectives, and audiences, covering all major areas of conservation and renewable energy. DOE has organized its technology transfer programs to meet the specific information requirements of various audiences.

Three services are managed through subcontracts at the National Renewable Energy Laboratory (NREL): DOE's Energy Efficiency and Renewable Energy Clearinghouse (EREC), DOE's Energy Efficiency and Renewable Energy Network (EREN), and the FEMP Help Desk.

EREC provides basic, technical, and financial information on various energy efficiency and renewable energy technologies and programs. The audience served by EREC includes the general public, business and industry, educational community, media, utility companies, and state and local governments. Information is provided in the form of fact sheets, DOE and National Laboratory books and brochures, bibliographies, and on-line computer-generated technology synopses. Some requests are handled completely over the phone and the caller receives no publications. EREC's telephone number is 800-DOE-EREC (800-363-3732) and its Web site is at www.eren.doe.gov/consumerinfo. In FY 2000, EREC staff responded to 49,738 inquiries and disseminated 241,196 publications.

EREN is the official Web site of the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE). The audience served by EREN includes business and industry, the general public, the educational community, the media, and state and local governments. EREN's Web address is www.eren.doe.gov. The site is a comprehensive resource for energy information, providing links to more than 600 energy-related Web sites, allowing keyword searches, and offering a full range of information on topics such as building energy efficiency, wind power, and alternative fuels. In addition, EERE provides its organizational chart, major initiatives, and budget. The site also features current press releases, consumer information, and lists of discussion groups on various energy-related topics. There are even forms to submit energy-related questions and to subscribe to the EREN Network News e-mail newsletter.

The FEMP Help Desk provides Federal energy managers with specialized information on effective energy management practices, technical assistance on implementing Federal sector energy projects, financing information, energy modeling software, publications, and energy management training programs. The Help Desk responds to requests for information via a toll-free telephone service, electronic mail, and through the Internet. The Help Desk was merged into EREC in FY 1997. The telephone number is 800-DOE-3732. The Web site is www.eren.doe.gov/femp.

The National Energy Information Center (NEIC) responds to public and private sector questions on energy production, consumption, prices, resource availability, and projections of supply and demand. It also makes available the publications produced by the DOE Energy Information Administration. NEIC provides information to Federal employees and the public at www.eia.doe.gov. Electronic inquiries may be sent to infoctr@eia.doe.gov. In FY 2000, NEIC staff responded to 29,000 inquiries and distributed approximately 28,900 publications.

The Office of Scientific and Technical Information (OSTI), as part of the Office of Science, provides coordination and direction for the management of scientific and technical information resulting from the DOE's multi-billion dollar research and development activities. As a cross-cutting Headquarters office, OSTI accomplishes its mission through the Scientific and Technical Information Program (STIP). STIP operates in partnership with program offices, operations offices, and contractors to develop and implement information management "best business practices" to ensure that DOE maximizes the return on its $6 billion annual R&D investment.

OSTI collects, processes, and disseminates DOE-originated research information and selected worldwide research literature on subjects of interest. OSTI also provides scientific and technical information services to, or on behalf of, DOE elements in support of DOE mandates, missions, and objectives. OSTI serves the public directly or indirectly through agreements with the National Technical Information Service, Government Printing Office, depository libraries, and commercial vendors. EnergyFiles is a publicly available, web-based gateway to an array of energy information. Included among the EnergyFiles family is the DOE Information Bridge, an electronic full-text collection of 81,320 documents available to the DOE research community.

OSTI manages a comprehensive collection of approximately one million scientific and technical information documents, representing 50 years of energy-related activities. The organization also maintains the Energy Science and Technology Database (EDB), which has more than 3.5 million

summaries of DOE and worldwide information. EDB is made available to the public on-line and on CD-ROM through commercial vendors. The majority of its users are industry, Federal and State officials, contractors, libraries, research institutions, and the public. In FY 2000, OSTI added 112,999 research summaries to the database and provided 11,582 full-text documents for public availability to the National Technical Information Service and the Government Printing Office Depository Library Program.

FY 2000 initiatives included a strategic effort to process and disseminate information in an increasingly decentralized environment. As a continuing step towards a "National Library of Energy Science and Technology," the effort will significantly improve DOE and public access to bibliographic and full-text information without major additional investment. In addition to the core program activities, OSTI's other services include developing Internet-based applications for DOE offices, providing information management advice and consultation to the Departmental community, managing and disseminating DOE and Nuclear Regulatory Commission scientific and technical software, and representing the United States in multilateral and bilateral international information exchange agreements.

The DOE public information mechanisms include several direct service programs designed to provide technical assistance to specific target groups. Some of these include:

- The State Energy Program, a formula grant program, which provides a flexible, supportive framework to enable the States to address their own energy priorities, as well as focus on national initiatives and strengthens their capabilities to deliver energy services. This customer-driven program seeks to increase the extent to which Federal, State, and local governments work with other public and private sector entities to achieve widespread adoption of available energy efficiency and renewable energy technologies, and to demonstrate the use of emerging technologies which benefit the entire economy.

- The Special Projects component of the State Energy Program offers States the opportunity to apply for competitively selected grants covering a wide range of activities that may expand upon a State's formula grant activities or offer an opportunity to take new initiatives. These projects are designed to utilize the State's skills in forming and sustaining partnerships with local governments, industry, utilities, and private organizations. Many of these projects involve the dissemination of information about, and/or the demonstration of the viability of a variety of energy efficiency and renewable energy applications.

- The Industrial Assessment Center (IAC) Program provides no-cost energy, waste, and productivity assessments to help small and mid-sized manufacturers identify measures to maximize energy-efficiency, reduce waste, and improve productivity. The assessments are conducted by local teams of engineering faculty and students from 30 participating universities across the country. This program not only improves manufacturing efficiency, but at the same time provides valuable, hands-on technical training and experience for engineering students throughout the U.S. Additional information can be obtained by visiting the program Web site at www.oit.doe.gov.

## D. Financing Mechanisms for Energy Efficiency Improvements in Federal Facilities

During FY 2000, Federal agencies had three primary options for financing energy efficiency, water conservation, and renewable energy projects in buildings and facilities: direct appropriated funding, ESPCs, and utility energy service contracts (UESCs). The latter two options utilize non-Government sources of funding and can be used to supplement Government funding. Each of these three sources can be combined with another. Formerly, the DOE's Federal Energy Efficiency Fund grant program was a fourth option available to agencies for funding projects; however, there were no appropriations for the Fund in FY 2000.

To the extent that agencies have been able to provide complete reporting, funding from the three sources totaled approximately $599 million in FY 2000. While these three categories of funding are not entirely comparable, they do indicate that ESPCs and UESCs have become the dominant source of support for efficiency investments throughout the Federal Government. Energy efficiency investment from ESPCs and UESCs increased 17.4 percent from $395.3 million in FY 1999 to $478.5 million in FY 2000. In FY 1998, investment from these sources totaled only $142.6 million.

Since 1985, The Government has invested approximately $3.8 billion in energy efficiency, $2.5 billion of which was direct appropriations and $1.3 billion from alternative financing mechanisms ($0.8 billion from ESPCs and $0.5 billion from UESCs).

### 1. Direct Appropriations

The National Energy Conservation Policy Act requires each agency, in support of the President's annual budget request to Congress, to specifically set forth and identify funds requested for energy conservation measures. Table 4-A presents agency funding (in nominal dollars) reported from FY 1985 through FY 2000 for energy conservation retrofits and capital equipment. Table 4-B presents the same information in constant 2000 dollars. In constant dollars, funding for energy conservation declined from $375.3 million in FY 1985 to a low of $67.0 million in FY 1989. Reports from Federal agencies indicated that $121.1 million was spent on retrofit expenditures in FY 2000, compared with $209.4 million in FY 1999. In some cases, the data provided by the agencies include funding from operation and maintenance accounts that was specifically identified as contributing to energy efficiency. Figure 4 illustrates agency spending trends for the five largest energy-consuming agencies and the remaining group of Federal agencies.

The Defense Department funded $44.4 million in expenditures for energy efficiency projects in FY 2000, $48.7 million less than the previous year.

## Table 4-A
## Agency Direct Appropriations for Energy Conservation Retrofits and Capital Equipment, FY 1985 through FY 2000 (Thousands of Nominal Dollars)

| | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DOC | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 872 | 0 | 51 | 0 | 0 | NA | 330 | N/A | 257 |
| **DOD** | **136,100** | **120,000** | **5,550** | **5,280** | **1,500** | **1,020** | **10,000** | **49,669** | **14,444** | **109,000** | **189,600** | **112,487** | **118,970** | **191,446** | **91,243** | **44,442** |
| **DOE** | **14,800** | **14,500** | **16,500** | **18,900** | **19,400** | **19,500** | **20,400** | **20,650** | **20,950** | **24,850** | **30,200** | **0** | **0** | **0** | **0** | **0** |
| DOI | 3,198 | 5,535 | 0 | 0 | 4,338 | 0 | 1,272 | 9,800 | 4,859 | 1,662 | 779 | 891 | 0 | 160 | 1,730 | 23,999 |
| DOJ | 0 | 0 | 0 | 195 | 484 | 6,100 | 26,400 | 0 | N/A | 1,284 | 994 | 1,559 | 2,091 | 1,500 | 1,615 | 1,170 |
| DOL | 238 | 31 | 106 | 142 | 584 | 17 | 35 | 16 | 0 | 0 | N/A | 366 | 0 | 0 | 40 | 0 |
| DOT | 13,650 | 15,000 | 12,104 | 12,700 | 2,908 | 0 | 460 | 143 | 593 | 5,970 | 3,793 | 2,585 | 3,176 | 3,000 | 9,005 | 2,664 |
| EPA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 500 | 0 | 1,720 | 1,600 | 1,600 | 0 | 0 | 0 |
| **GSA** | **6,700** | **6,100** | **2,900** | **9,400** | **4,868** | **11,125** | **30,123** | **37,000** | **30,000** | **37,000** | **7,242** | **7,400** | **20,000** | **0** | **25,000** | **17,000** |
| HHS | 0 | 0 | 0 | 427 | 427 | 427 | 427 | 0 | 1,813 | 1,915 | 1,271 | 2,676 | 2,879 | 2,200 | 4,793 | 8,440 |
| HUD | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 43 | 30 | 43 | 0 | 2,418 | 0 | 0 | 0 |
| NASA | 11,800 | 12,100 | 1,700 | 1,400 | 4,499 | 2,943 | 7,556 | 7,086 | 25,072 | 24,658 | 20,666 | 30,266 | 15,919 | 13,813 | 18,509 | 11,731 |
| PCC | 1,274 | 73 | 1,174 | 600 | 378 | 361 | 807 | 249 | 500 | 608 | 14 | 23 | 3 | 104 | N/A | N/A |
| RRB | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 13 | 33 | 0 | 38 | 23 | 0 | 0 |
| SSA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,000 |
| STATE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 67 | 0 | 0 | 1,902 | 51 | 1,238 | 0 |
| TRSY | 0 | 0 | 2,977 | 2,393 | 2,823 | 1,134 | 836 | 0 | 1,344 | 4,826 | 2,810 | 170 | 2,990 | 1,400 | 1,495 | 2,152 |
| TVA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 475 | 844 | 4,277 | 522 | 1,158 | 1,466 | 1,022 | 284 |
| USDA | 2,500 | 0 | 0 | 500 | 500 | 1,547 | 1,752 | 7,300 | 7,045 | 7,277 | 2,894 | 5,983 | 3,891 | 1,765 | 994 | 1,954 |
| **USPS** | **55,300** | **9,300** | **5,100** | **3,800** | **4,000** | **4,000** | **4,000** | **2,293** | **1,116** | **1,123** | **10,050** | **9,000** | **16,000** | **31,000** | **38,000** | **6,000** |
| **VA** | **13,000** | **11,500** | **9,500** | **9,860** | **5,500** | **11,200** | **9,970** | **10,000** | **12,100** | **9,050** | **11,960** | **3,700** | **7,400** | **13,000** | **10,500** | **0** |
| Total | 258,560 | 194,139 | 57,611 | 65,597 | 52,209 | 59,374 | 114,038 | 145,078 | 120,870 | 230,228 | 288,346 | 179,228 | 200,435 | 261,258 | 205,184 | 121,093 |

Notes: **Bold** indicates top five energy users in buildings and facilities (DOD, DOE, VA, USPS, GSA). In past years, DOE also included funds for energy surveys. Does not include energy savings performance contracts and utility demand side management incentives.

Source: Federal Agency Annual Energy Management Data Reports

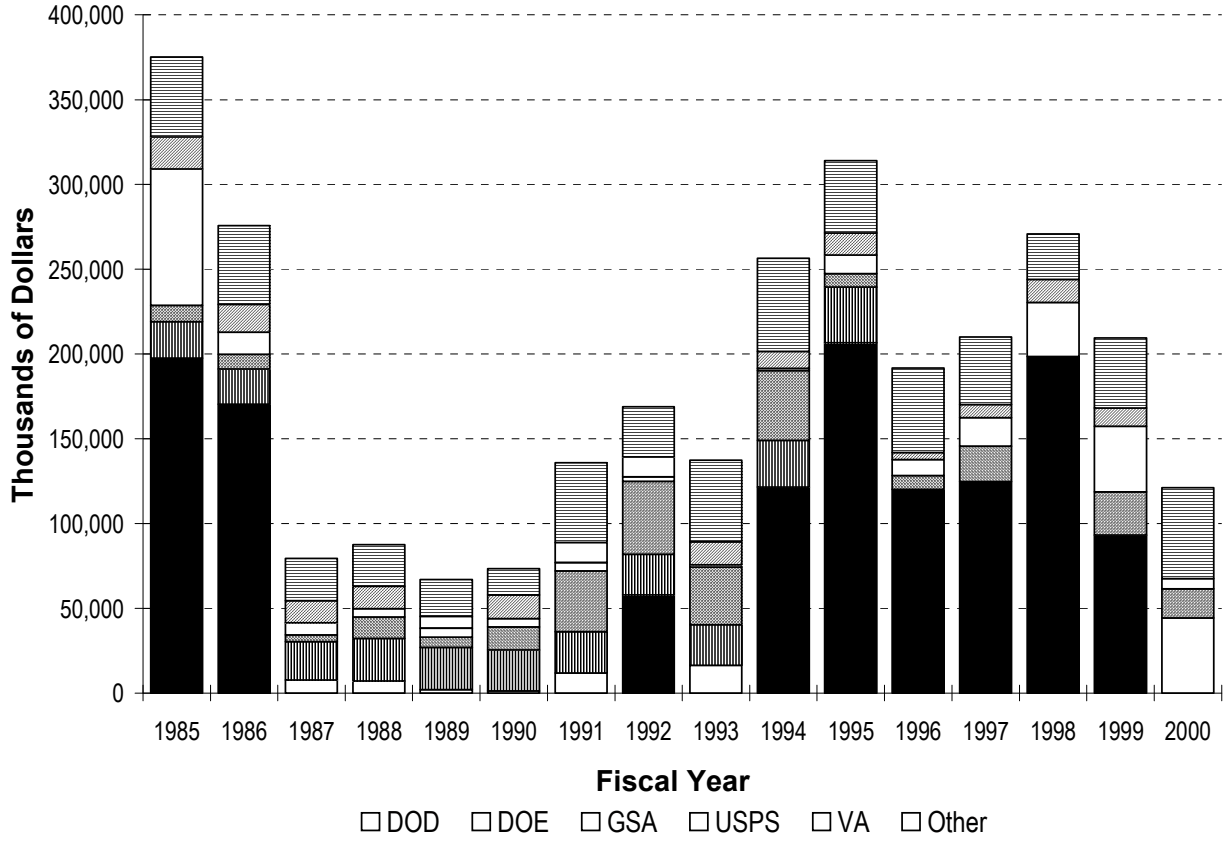
## Table 4-B
## Agency Direct Appropriations for Energy Conservation Retrofits and Capital Equipment, FY 1985 through FY 2000 (Thousands of Constant 2000 Dollars)

| | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DOC | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,015 | 0 | 57 | 0 | 0 | 0 | 342 | 0 | 257 |
| **DOD** | **197,533** | **170,455** | **7,645** | **7,040** | **1,926** | **1,261** | **11,919** | **57,822** | **16,414** | **121,381** | **206,536** | **120,307** | **124,706** | **198,390** | **93,105** | **44,442** |
| **DOE** | **21,480** | **20,597** | **22,727** | **25,200** | **24,904** | **24,104** | **24,315** | **24,040** | **23,807** | **27,673** | **32,898** | **0** | **0** | **0** | **0** | **0** |
| DOI | 4,642 | 7,862 | 0 | 0 | 5,569 | 0 | 1,516 | 11,409 | 5,522 | 1,851 | 849 | 953 | 0 | 166 | 1,765 | 23,999 |
| DOJ | 0 | 0 | 0 | 260 | 621 | 7,540 | 31,466 | 0 | 0 | 1,430 | 1,083 | 1,667 | 2,192 | 1,554 | 1,648 | 1,170 |
| DOL | 345 | 44 | 146 | 189 | 750 | 21 | 42 | 19 | 0 | 0 | 0 | 391 | 0 | 0 | 41 | 0 |
| DOT | 19,811 | 21,307 | 16,672 | 16,933 | 3,733 | 0 | 548 | 166 | 673 | 6,648 | 4,132 | 2,765 | 3,329 | 3,109 | 9,189 | 2,664 |
| EPA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 568 | 0 | 1,874 | 1,711 | 1,677 | 0 | 0 | 0 |
| **GSA** | **9,724** | **8,665** | **3,994** | **12,533** | **6,249** | **13,752** | **35,903** | **43,073** | **34,091** | **41,203** | **7,889** | **7,914** | **20,964** | **0** | **25,510** | **17,000** |
| HHS | 0 | 0 | 0 | 569 | 548 | 528 | 509 | 0 | 2,060 | 2,133 | 1,385 | 2,862 | 3,018 | 2,280 | 4,891 | 8,440 |
| HUD | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 49 | 33 | 47 | 0 | 2,535 | 0 | 0 | 0 |
| NASA | 17,126 | 17,188 | 2,342 | 1,867 | 5,775 | 3,638 | 9,006 | 8,249 | 28,491 | 27,459 | 22,512 | 32,370 | 16,687 | 14,314 | 18,887 | 11,731 |
| PCC | 1,849 | 104 | 1,617 | 800 | 485 | 446 | 962 | 290 | 568 | 677 | 15 | 25 | 3 | 108 | 0 | 0 |
| RRB | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 14 | 36 | 0 | 40 | 24 | 0 | 0 |
| SSA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,000 |
| STATE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75 | 0 | 0 | 1,994 | 53 | 1,263 | 0 |
| TRSY | 0 | 0 | 4,101 | 3,191 | 3,624 | 1,402 | 996 | 0 | 1,527 | 5,374 | 3,061 | 182 | 3,134 | 1,451 | 1,526 | 2,152 |
| TVA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 540 | 940 | 4,659 | 558 | 1,214 | 1,519 | 1,043 | 284 |
| USDA | 3,628 | 0 | 0 | 667 | 642 | 1,912 | 2,088 | 8,498 | 8,006 | 8,104 | 3,153 | 6,399 | 4,079 | 1,829 | 1,014 | 1,954 |
| **USPS** | **80,261** | **13,210** | **7,025** | **5,067** | **5,135** | **4,944** | **4,768** | **2,669** | **1,269** | **1,251** | **10,948** | **9,626** | **16,771** | **32,124** | **38,776** | **6,000** |
| **VA** | **18,868** | **16,335** | **13,085** | **13,147** | **7,060** | **13,844** | **11,883** | **11,641** | **13,750** | **10,078** | **13,028** | **3,957** | **7,757** | **13,472** | **10,714** | **0** |
| Total | 375,269 | 275,766 | 79,354 | 87,463 | 67,021 | 73,392 | 135,921 | 168,892 | 137,353 | 256,379 | 314,102 | 191,688 | 210,099 | 270,733 | 209,371 | 121,093 |

Notes: **Bold** indicates top five energy users in buildings and facilities (DOD, DOE, VA, USPS, GSA). In past years, DOE also included funds for energy surveys. Does not include energy savings performance contracts and utility demand side management incentives.

Source: Federal Agency Annual Energy Management Data Reports

**FIGURE 4**
**Direct Appropriations for Energy Conservation Retrofit**
**(In Constant 2000 Dollars)**




Source: Federal Agency Annual Energy Management Data Reports

## 2. Federal Energy Efficiency Fund

The Federal Energy Efficiency Fund was established by section 152 of EPACT, which amended section 546 of NECPA, to provide grants to agencies to assist them in meeting the mandated energy efficiency and water conservation requirements. The limited spending authority available in FY 1994 and FY 1995 was applied to those proposals which were most competitive, considering the five following factors:

- The cost-effectiveness of the project (saving-to-investment ratio).
- The net dollar cost savings to the Federal Government.
- The amount of energy savings to the Federal Government.
- The amount of funding committed by the agency requesting financial assistance.
- The amount of funding leveraged from non-Federal sources.

No spending authority has been provided beyond FY 1995. A total of 114 proposals were received during FY 1994 and FY 1995 and Fund grants were provided for 37 projects. Of these, 35 projects provide energy savings of 5.8 trillion Btu and two projects result in water conservation in the amount of 738 million cubic feet, with an estimated energy and water cost savings of $54 million (before payback of the initial investment) over the useful lives of the projects. The total Fund investment to realize these savings was $7.9 million, which leveraged $3.6 million in Federal-agency funding and $0.9 million in non-Federal funding. The projects encompass 14 states and the District of Columbia, with one project located in the Caribbean.

### 3. Energy Savings Performance Contracting

Section 155 of EPACT amended Title VIII of NECPA, sections 801 and 804, relating to energy savings contracts. Section 801, as amended, gives agencies the authority to enter into ESPCs and describes the methodology of contract implementation. The ESPC program was created to provide agencies with a quick and cost-effective way to increase the energy efficiency of Federal buildings. Under an ESPC, a private sector energy service company (ESCO) will assume the capital costs of installing energy conservation equipment and renewable energy systems. The ESCO guarantees the agency a fixed amount of energy cost savings throughout the life of the contract and is paid from those cost savings. Agencies retain the remainder of the energy cost savings.

On April 10, 1995, DOE published in the *Federal Register* (10 CFR Part 436) a final rule that sets forth the regulations for energy savings performance contracting. An application process for a Qualified List of ESCOs was also released with the ESPC regulations. Only firms on the Qualified List may receive an ESPC contract award. Firms that wish to be on the Qualified List must submit an application to DOE and possess the required experience and expertise. The List is continually updated.

On November 2, 1998, the Energy Conservation Reauthorization Act was signed by President Clinton to become Public Law 105-388. The law made several significant changes to EPACT and NECPA. Section 4 of Public Law 105-388 amends NECPA section 801 to extend the authority of Federal agencies to enter into ESPCs through September 30, 2003. Without this amendment, the authority would have expired on April 10, 2000. Section 4 also amends the definition of "Federal agency" in NECPA Section 804 to include each authority of the U.S. Government, whether or not it is within or subject to review by another agency.

On June 3, 1999, President Clinton signed Executive Order 13123. Section 403(a) states that "Agencies shall maximize their use of available alternative financing contracting mechanisms, including Energy Savings Performance Contracts." This Section goes on to state that "Energy Savings Performance Contracts...provide significant opportunities for making Federal facilities more energy efficient at no net cost to taxpayers."

During FY 2000, 81 ESPC contracts or delivery orders were awarded at 10 agencies. These include delivery orders awarded through the DOE/FEMP Regional and Tech-Specific ESPC programs as well as projects awarded by the Department of Defense and other agencies. Total contractor investment from these projects is approximately $287.0 million, providing the Government with an opportunity to save almost 1.7 trillion Btu each year. These ESPCs include 58 by the Department of Defense, six by the General Services Administration and the Department of Veteran's Affairs, three by the National Aeronautic and Space Administration, two by the Departments of Labor and Agriculture, and one each by the Department of Energy, Department of the Interior, the Environmental Protection Agency and the U.S. Postal Service.

**Energy Savings Performance Contracts and Delivery Orders Awarded by Federal Agencies in FY 2000**

| Agency | Number of Delivery Orders/ Contracts | Contractor Investment (Thousand $) | Allocation of Project Cost Savings (Thousand $) | | | Annual Energy Savings (MMBTU) |
|---|---|---|---|---|---|---|
| | | | Guaranteed Total Cost Savings | Less Payment to Contractor | Net Savings to Government | |
| Agriculture | 2 | $7,018 | $14,134 | $14,045 | $89 | 33,329 |
| Defense | 58 | $237,628 | $487,252 | $414,563 | $56,352 | 1,274,866 |
| Energy | 1 | $4,450 | $10,401 | $9,685 | $716 | 86,713 |
| EPA | 1 | $4,276 | $8,967 | $8,688 | $279 | 11,199 |
| Interior | 1 | $2,047 | $5,726 | $5,575 | $151 | 10,931 |
| Labor | 2 | $1,689 | $3,452 | $3,417 | $36 | 28,489 |
| GSA | 6 | $14,799 | $23,337 | $23,148 | $189 | 90,571 |
| NASA | 3 | $4,073 | $8,910 | $8,910 | $0 | 43,880 |
| U.S. Postal Service | 1 | $1,626 | $2,131 | $1,951 | $180 | 13,442 |
| Veterans Affairs | 6 | $9,033 | $19,036 | $17,974 | $1,062 | 98,286 |
| Total | 81 | $286,638 | $583,347 | $507,956 | $59,053 | 1,691,706 |

In FY 2000, the Department of Defense through a decentralized approach, awarded the largest number of contracts/delivery orders with 58 ESPC projects. These contracts include many infrastructure upgrades and new equipment to help DOD installations reduce energy and water consumption. Examples include new thermal storage systems, chillers, boilers, lights, motors, EMCS systems and water reducing devices. Normally, cost savings are used to first pay the contractor, and then are used to offset other base operating support expenses. In some cases, however, installations decide to seek a shorter contract term and defer all Government cost savings until contract completion. In these cases, the savings generated by ESPCs help to reduce the energy consumption, but do not reduce the total cost of operation until the contracts expire. After contract expiration and the retrofits are paid for, the Department of Defense will be able to obtain full cost savings.

In FY 2000, the Department of Defense received Congressional funding of $4 million to facilitate implementation of ESPC contracts. A similar $4 million Congressional appropriation for ESPCs was made in FY 2001.

Awarding ESPCs on a one-by-one basis has often proven to be complex and time consuming. To make it easier to use ESPCs, DOE/FEMP developed Regional and Technology-Specific Super ESPCs. Both Regional and Technology-Specific Super ESPCs share the same general contract terminology and provisions with conventional ESPCs and they present several significant advantages to Federal agencies.

Super ESPCs are unlike conventional ESPCs in two fundamental ways. First, a Super ESPC blankets a large geographic territory; a conventional ESPC is used for a specific site. Second, Super ESPCs substantially reduce the lead time to contract with an ESCO for energy services. Super ESPCs are broad area indefinite delivery, indefinite quantity (IDIQ) contracts that allow agencies to negotiate site-specific delivery orders with an ESCO without having to start the

contracting process from scratch. Demand on agency resources to develop and award contracts, as well as lead times, will be greatly reduced, and energy savings will be realized more quickly.

The Western Regional Super ESPC was awarded to five ESCOs in May 1997 and covered the states of Alaska, Arizona, California, Hawaii, Idaho, Nevada, Oregon, Washington, and U.S. Pacific Territories. The Southeast (covering Alabama, Arkansas, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Puerto Rico and the U.S. Virgin Islands) Midwest (covering Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio and Wisconsin), and Central Regional Super ESPCs (covering Colorado, Kansas, Louisiana, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah and Wyoming) were awarded to various ESCOs during FY 1998 and FY 1999.

The Mid-Atlantic (covering Delaware, Maryland, New Jersey, Pennsylvania, Virginia, West Virginia and the District of Columbia) and Northeast Regional Super ESPCs (covering Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont) were awarded two ESCOs during FY 2000. The Mid-Atlantic Regional ESPC was awarded to one ESCO (ERI Services, Inc.) Also, the Northeast Regional Super ESPC was awarded to one ESCO (Honeywell, Inc.).

During FY 2000, 19 Regional Super ESPC delivery orders were awarded. Total contractor investment is more than $57 million, providing almost 540 billion Btu of energy savings to the Government. These delivery orders include six by the GSA, four by the Department of Defense, two by the Department of Agriculture and the Department of Labor, and one each by the DOE, the Environmental Protection Agency, the Department of the Interior, the Department of Veteran's Affairs, and the National Aeronautics and Space Administration. Also during FY 2000, one Technology-Specific Super ESPC delivery order was awarded by the Department of Defense at the Patuxent River Naval Air Station in Maryland.

Technology-Specific Super ESPCs emphasize a particular advanced energy-efficiency or renewable energy technology to advance these proven, yet still emerging, technologies in the Federal marketplace. They blanket the entire nation and carry the same agency resource and time saving benefits as Regional Super ESPCs. ESCOs chosen for these awards have unique capabilities and experience in providing energy savings through installation of the technology, thereby greatly reducing the risks of misapplying emerging technologies. Technology-Specific Super ESPCs can also be comprehensive projects employing multiple energy conservation measures, as long as the named technology is the focus of the project.

## Delivery Orders Awarded with DOE Super ESPC Program Support

| Project Name/Location | Project Description | Contractor Investment | Savings (MMBTU) |
|---|---|---|---|
| *Agriculture,* National Animal Disease Center, Agricultural Research Services, Ames, IA | Boilers, EMCS, HVAC, Lighting, Electric Motors, Electrical/Cogeneration Systems, Electric Distribution System, Rate Reduction/Audit | $6,363,685 | 26,031 |
| *Agriculture,* National Agricultural Library, Beltsville, MD | Lighting, Burner Replacement, Chiller Plant Automation, Building Automation System | $654,100 | 6,298 |
| *Defense,* Presidio of Monterey, Monterey, CA | Lighting | $1,786,056 | 4,632 |
| *Defense,* National Imagery & Mapping Agency | Lighting, Occupancy Sensor installation and PCU consolidation | $949,114 | 9,328 |
| *Defense,* Fort Rucker, Fort Benning, Fort Gordon, Fort Jackson, & Fort Stewart Medical Commands | Chiller, EMCS, HVAC, Lighting, Building Envelope Modifications, Piping and Distr. Systems, Motors and Drives | $11,781,507 | 110,068 |
| *Defense*, Fox Army Health Center, Huntsville, AL | EMCS, Chiller and Lighting Improvements | $1,326,355 | 12,391 |
| *Defense,* Patuxent River Naval Air Station, Patuxent River, MD | Tech-Specific Super ESPC - Geothermal Heat Pumps and EMCS | $4,785,168 | 44,705 |
| *Energy,* Pantex Plant, Amarillo, TX | Lighting, Chilled water and steam distribution piping systems, air handling units, solar water heaters, temperature controllers, ozone laundry system, preheat coil controls, BAS/EMS system | $4,449,685 | 86,713 |
| *Environmental Protection Agency,* National Risk Management Research Laboratory, Ada, OK | Renewable Energy Systems | $4,275,612 | 24,900 |
| *General Services Administration,* Ft. Worth Office for Project in Austin, Ft. Worth, TX | Chillers, EMCS, Lighting, Water | $3,721,661 | 15,295 |
| *General Services Administration,* Dallas - Ft.Worth Office for Project in South Texas Sites, Ft.Worth, TX | Lighting, Chiller Replacements, Solar, EMCS, VFDs, Water | $956,335 | 5,733 |
| *General Services Administration,* Leo O'Brien Federal Building, Albany, NY | Boiler, Chiller, Building Automation, HVAC, Lighting, Building Envelope Mods., Motors and Drives | $983,215 | 6,693 |

| Project Name/Location | Project Description | Contractor Investment | Savings (MMBTU) |
|---|---|---|---|
| *General Services Administration,* Denver Federal Center, Lakewood, CO | EMCS, chillers, pump w/VFD, Variable volume chilled water system, Lighting, Irrigation system controls, Solar domestic hot water system repair/rehabilitation | $2,426,454 | 34,201 |
| *General Services Administration,* Lincoln Courthouse and Federal Building, NE | Boilers, Chillers, EMCS VAV, Lighting, Steam Traps and Water | $4,120,128 | 20,784 |
| *General Services Administration,* Releigh, NC | EMCS, Boiler and Chiller Improvements | $2,591,453 | 24,210 |
| *Interior,* Sherman Indian High School, Riverside, CA | Lighting, PV System, HVAC mods, Pool Cover and Ventilation Controls, Pump VFD and Controls | $2,366,270 | 10,931 |
| *Labor,* Job Corps Centers, San Bernadino & Sactramento, CA | Lighting | $205,475 | 8,800 |
| *Labor,* Gary Job Corps Center, San Marcos, TX | EMCS, HVAC, Lighting, Renewables, Water | $1,483,360 | 19,689 |
| *National Aeronautics and Space Administration,* Ames Research Center, San Francisco, CA | EMCS, Lighting, and Renewable Energy Systems | $1,916,688 | 24,133 |
| *Veterans Affairs,* Medical Center, Salt Lake City, UT | Chiller, EMCS, HVAC, Lighting, RE systems, Electric distribution system, Rate reduction/audit | $4,921,796 | 52,386 |

The first Technology-Specific Super ESPC was awarded in September 1996 to provide solar hot water heating with parabolic troughs. The contract value was $30 million. During FY 1998, the photovoltaics Technology-Specific Super ESPC was awarded to two ESCOs. This contract was worth $50 million. In February 1999, the geothermal heat pump Technology-Specific Super ESPC was awarded to five ESCOs. This contract was worth $500 million. In September 2000, a geothermal heat pump Technology-Specific Super ESPC was awarded for a project at the U.S. Navy's Patuxent River Naval Air Station. Contractor investment in this project is almost $4.4 million. Annual energy savings include 952,466 kWh of electricity, 9,964 gallons of fuel oil, and 121,979 thems of natural gas. In addition, the project conserves 16.5 million gallons of water per year. The total annual value of the energy and water savings will be approximately $330,070 per year over the 20 year term of the project. Savings are due primarily to lighting retrofits and replacement of conventional HVAC equipment with geothermal heat pumps. In addition, cooling requirements for a mission-critical environmental test chamber – currently met by circulating treated domestic water, which is then ejected to the building storm sewer – will now be met with a closed-loop geothermal system.

Over the next several years, it is anticipated that more Technology-Specific Super ESPCs will be awarded covering a wide range of energy and cost saving technologies.

### 4. Utility Energy Service Contracts

Section 403(a) of Executive Order 13123 provides that Federal agencies maximize their use of available alternative financing contracting mechanisms, including utility energy service contracts (UESCs), when life-cycle cost-effective, to meet the energy reduction goals of the order. Agencies are encouraged to partner with the private sector to implement facility and energy improvements, streamline contracts, and maximize purchasing power. UESCs provide significant opportunities for making Federal facilities more energy efficient at no net cost to taxpayers.

The financing mechanism offered through UESCs enables agencies to implement energy and water efficiency projects without obtaining direct appropriations. These energy contracts are designed to leverage private sector financing to pay for energy efficiency improvements. The net cost to the participating Federal agency remains minimal, as the projects pay for themselves from a share of the energy cost savings. The financing tool also helps the agency save time and resources by using the services provided by the utility. Utility services range from rebates on energy-efficient equipment to energy audits, feasibility studies, design, finance, and delivery of complete turn-key projects, with contract terms generally limited to 10 years. Projects typically begin with an energy audit and feasibility study, and proceed to engineering, design, and installation phases.

FEMP helps Federal agencies and their utility companies work together to save energy and dollars at Federal facilities. FEMP supports agencies and their utilities by promoting Federal/utility partnerships through the Federal Utility Partnership Working Group and supplying alternative financing information. FEMP provides comprehensive assistance and services to agencies with the support of partners, including DOE offices, DOE national laboratories, and private sector contractors. Six DOE Regional Offices serve as the initial customer contact points and customer advocates. FEMP also sponsors utility-related training, helps remove regulatory barriers, and provides information on utility restructuring and its effects on Federal agencies to help agencies to take advantage of the partnerships.

In FY 2000, a total of 84 UESCs were implemented by all Federal agencies. Private sector investment in the projects totaled $191.3 million. The estimated annual energy cost savings from the 84 projects is $40 million.

Projects were undertaken by agencies to accomplish a wide variety of energy efficiency improvements. Of the 84 UESCs awarded in FY 2000, 41 were implemented by the Department of Defense. Contracts were put in place to perform infrastructure upgrades and purchase new equipment to help installations reduce energy and water consumption. Examples of equipment purchased with the UESC financing tool include: new thermal storage systems, chillers, boilers, lights, motors, EMCS systems and water reducing devices.

GSA awarded three utility financed projects in FY 2000 with a total value of $9.9 million and expected annual energy cost savings of 11.4 billion Btu. The contracts were used to implement a

large number of energy retrofits at three GSA facilities in Region 11. Combined with those already in progress, GSA has 13 UESC projects in place.

In FY 2000, the Department of Health and Human Services focused its efforts on promoting and facilitating the use of alternative financing mechanisms to implement energy and water efficiency projects. NIH entered into three UESCs for a total of $38.9 million in FY 2000. These projects included the construction and operation of a 23-megawatt cogeneration facility, the installation of an energy management control system, and the upgrade of lighting and motors at the main campus.

The Office of Personnel Management entered into a $2 million UESC with its Washington, D.C. utility provider in FY 2000. This contract led to the retrofitting of all of the lights in the Theodore Roosevelt Building with new energy efficient fluorescent tubes and ballasts. The contract was later amended and enlarged to include the air conditioning chiller plant replacement, begun in FY 2000 and continued in FY 2001.

## 5. Life-Cycle Costing (LCC)

Section 544 of NECPA, as amended in 1988, requires DOE to establish practical and effective methods for estimating and comparing the life-cycle costs for Federal buildings using the sum of all capital and operating costs for energy systems of new buildings involved over the expected life of such systems or during a period of 25 years, whichever is shorter, and using average fuel costs and a discount rate determined by the Secretary of Energy. In addition, section 544 requires that procedures be developed in applying and implementing the methods that are established. EPACT further amends NECPA to require, after January 1, 1994, agencies which lease buildings to fully consider the efficiency of all potential building space at the time of renewing or entering into a new lease.

In the past, FEMP has published updated fuel price projections for life-cycle cost analyses on October 1 of each year to coincide with the beginning of the fiscal year. The FY 2000 update of the *Energy Price Indices and Discount Factors for Life-Cycle Cost Analysis, Annual Supplement to Handbook 135* was published and distributed to Federal energy managers in April 1999.

## E. ENERGY STAR® and Energy Efficient Product Procurement

Executive Order 13123 directs Federal agencies to purchase ENERGY STAR labeled products, or, for those product types not covered by the EPA/DOE ENERGY STAR labeling program, products "in the upper 25 percent of energy efficiency as designated by FEMP." Reinforcing the message is a stipulation in the Federal Acquisition Regulations (48 CFR 23.704) that "Agencies shall implement cost-effective contracting preference programs favoring the acquisition of . . . energy-efficient products. . . ., i.e., products that are in the upper 25 percent of energy-efficiency for all similar products." This FAR provision was initiated in response to Executive Order 12902 (1994), and efforts are presently under way to modify the language in accordance with E.O. 13123 (e.g., to refer to ENERGY STAR products).

The ENERGY STAR labeling program is a joint effort between EPA and DOE to get manufacturers (and some retailers) to identify efficient products with an easily recognizable logo, the ENERGY STAR. Since this is a nation-wide labeling program covering multiple products, it makes it very simple for customers to identify truly efficient models among those offered – for instance, on a retail floor, or among various models listed in a product catalog. In FY 2000, the program included a wide variety of office equipment and home heating and cooling products, as well as many consumer audio and video products (e.g., TVs, VCRs, and DVD players), appliances, and residential windows. Some commercial equipment was also covered, such as exit signs, low-voltage distribution transformers, and roof products.

To assist Federal agencies in meeting the requirements of the Executive Order and FAR directives, FEMP publishes a series of *Product Energy Efficiency Recommendations*, which delineate the efficiency levels that meet the ENERGY STAR and "upper 25%" requirements of the Executive Order. The *Recommendations* also provide cost-effectiveness examples, tips on important product selection parameters such as sizing and fuel choice, and information about buying efficient products from the Federal supply agencies: the Defense Logistics Agency (DLA) and the GSA. The *Recommendations*, which now cover more than 30 products, are available on FEMP's Web site at www.eren.doe.gov/femp/procurement, as well as in print, through a loose-leaf binder called "Buying Energy Efficient Products." The binder is available free of charge from FEMP's clearinghouse (800-363-3732); subscribers receive new and updated material as it is printed, approximately every six months.

To be most effective, FEMP's product efficiency recommendations need to be incorporated into other purchasing guidance, such as technical specifications and agency-specific policies and practices. Pursuant to this concern, FEMP has made considerable progress in partnership with the two major Government supply agencies, DLA and GSA. During FY 2000, FEMP worked with GSA's Federal Supply Service (FSS) and with DLA to identify energy-efficient equipment among supply offerings. As a result of FEMP's joint effort with GSA/FSS on electronic product coding, GSA customers shopping on-line can, in many cases, distinguish models that are ENERGY STAR or FEMP-compliant.

DLA's customers rely heavily on the information in the Federal Logistics Information System (FLIS) database to procure products and equipment. The FLIS catalogs millions of items by "national stock numbers" (NSNs), which can be accessed by vendor name or code.

DLA has established a database field within the FLIS that highlights positive environmental attributes, such as energy efficiency or recycled materials, using the FEMP efficiency thresholds to define “energy-efficient” and “water-conserving” (for plumbing fixtures such as showerheads and toilets).

By the end of FY 2000, FEMP’s biggest success with its energy-efficient purchasing program was the incorporation by several large Federal construction agencies of FEMP-recommended product efficiency levels into agency master, or guide, specifications for construction and major renovation. When an agency writes a FEMP recommendation into a “guide spec” for a given product, it generally assures that virtually all the buildings constructed by that agency will use only models that comply with the highly efficient levels – affecting millions of dollars worth of product. On the vanguard of this movement are the Army Corps of Engineers and the Navy. Products for which guide specifications incorporating FEMP’s recommended efficiency levels had been written by the end of fiscal year 2000 include electric chillers, fluorescent lighting, exit signs, distribution transformers, and roof products.

Finally, FEMP partnered with DLA and DOE's Office of Building Technologies in FY 2000 to issue a solicitation for a new generation of unitary air conditioners that are significantly more energy-efficient than models typically purchased. This type of "packaged" unit is often found on rooftops of low-rise federal and commercial buildings, and is typically specified on the basis of lowest first-cost rather than lowest life-cycle cost, including electricity (and peak demand) costs which are the focus of this solicitation. The intent is to use federal buying power to help establish an initial market demand that reduces the risk to manufacturers of developing and marketing a much more efficient and cost-effective line of products. The DLA solicitation will result in a separate basic ordering agreement that will also allow commercial and other non-federal organizations to buy high-performance rooftop units from winning bidders on the same terms as federal agencies.

## F. Integrated Whole Building Efficiency

### 1. Federal Building Energy Performance Standards

The Energy Conservation and Protection Act (ECPA), as amended by the Energy Policy Act of 1992, mandates that new Federal buildings must contain energy saving and renewable energy specifications that meet or exceed the energy saving and renewable energy specifications of the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)/ Illuminating Engineering Society of North America (IESNA) Standard 90.1-1989 and the Council of American Building Officials Model Energy Codes (MEC) 1992.

A final rule on the *Energy Code for New Federal Commercial and Multi-Family High Rise Residential Buildings* was published in the *Federal Register* on October 6, 2000 and became effective on October 8, 2001. The *Energy Code* revised the prior interim Federal standards to conform generally with the codified version of ASHRAE Standard 90.1-1989 and incorporated changes in the areas of lighting, mechanical ventilation, motors, building envelope, and fenestration rating test procedures, and test procedures for heating and cooling equipment. Additionally, the new lighting provisions are more stringent than those in Standard 90.1-1989 and reflect new information concerning energy requirements needed to achieve adequate lighting levels. In FY 2002, DOE initiated another update of the Federal commercial building standards using ASHRAE 90.1-1999 as the model, and expected to solicit public comments on this new proposed rule in a *Federal Register* notice during the latter part of 2002.

A separate proposed rule for new Federal residential buildings was issued by DOE in the *Federal Register* in May 1997. DOE has determined that the 1997 proposed rule does not contain sufficient cost effective, energy efficient requirements for new Federal residential buildings. Therefore, DOE will propose a new rule containing updated energy efficient measures.

### 2. ENERGY STAR® Buildings

Section 403 of Executive Order 13123 calls upon agencies to strive to meet the ENERGY STAR® building criteria for energy performance and indoor environmental quality in their eligible facilities to the maximum extent practicable by the end of 2002. Agencies have the option of using energy savings performance contracts, utility energy-efficiency service contracts, or other means to conduct evaluations and make improvements to their buildings in order to meet the criteria. Buildings that rank in the top 25 percent in energy efficiency relative to comparable commercial and Federal buildings will receive the ENERGY STAR® building label.

ENERGY STAR® is a program that was developed by EPA with DOE as a co-sponsor to promote energy efficiency through the use of online software that benchmarks and ranks office buildings in terms of energy efficiency. In FY 2000, only office buildings were able to be benchmarked by EPA's benchmarking tool. Other building types will be included in future years, beginning with laboratories and classroom buildings. Actual ENERGY STAR® Building certification and labeling is based upon measured building data and a comparison with archetypes in various regions of the country. Many agencies are using the five-stage ENERGY STAR® implementation strategy, which

consists of lighting upgrades, building tune-up, other load reductions, fan system upgrades, and heating and cooling systems upgrades.

The ENERGY STAR® Building program is currently being implemented and utilized by many different agencies. To spotlight a few examples:

- Energy consumption in the TVA's Chattanooga Office Complex was less than 50,000 Btu/GSF, which exceeds both TVA's target for facility design and the FY 2010 building energy reduction goal established in Executive Order 13123.
- The USPS is working to develop specific ENERGY STAR® criteria for postal facilities. During FY 2000, a beta test was conducted on the criteria using data collected from USPS "Do It Yourself" energy surveys and financial performance data. When completed, this effort will provide an ENERGY STAR® benchmarking model addressing USPS buildings.
- NASA analyzed 64 facilities at nine locations and as a result, two buildings will receive the ENERGY STAR® Label. Recommended ESPCs and UESCs were also developed to require pre- and post-retrofit ENERGY STAR® analyses of projects involving significant energy improvements in NASA office buildings.
- GSA has earned the ENERGY STAR® Building Label for 70 of its own facilities and one of its leased facilities. The total square footage for the facilities is 17.4 million GSF.
- Three EPA office buildings, either owned or leased by GSA, have been awarded the ENERGY STAR® label.

### 3. Sustainable Building Design

As required by Section 403(d) of Executive Order 13123, DOD and GSA, in consultation with DOE and EPA, have developed sustainable design principles. Agencies are required to apply such principles to the development, design, and construction of new facilities. Agencies shall optimize life-cycle costs, pollution, and other environmental and energy costs associated with the construction, life-cycle operation, and decommissioning of the facility. Agencies have the option of using ESPCs or UESCs as well, to aid them in constructing sustainably designed buildings.

All agencies are either developing or have implemented the Whole Building Design Guide (WBDC) and the U.S. Green Building Council's Leadership in Energy and Environment Design (LEED) programs into their facilities design standards and master planning process, as well as applying integrated design approaches to the life-cycle of buildings and infrastructures. The WBDG and LEED are part of a complete Internet resource to a wide range of building-related design guidance, criteria and technology allowing the integrating of sustainable building design. The WBDG is an up-to-date, knowledge-based, creatively linked to information across disciplines and traditional professional boundaries, intended to encourage the "whole building approach" to design and construction, and used by Federal, military and private sector architects, engineers, and project managers. The "whole buildings" design approach asks the members of the planning, design and construction team to look at the materials, systems and assemblies from many different perspectives. The design is evaluated for cost, quality-of-life, future flexibility, efficiency, overall environmental impact, productivity, creativity, and how the occupants will be enlivened.

Examples of criteria that have been incorporated in many facilities include the installation of high performance windows, direct-digital control remote control systems, high efficient electric lighting, new energy HVAC equipment, and increased insulation in roofs, walls and foundations. Many agencies are incorporating low-cost projects such as: replacing high volume water fixtures, purchasing solar power generation and installing solar lighting, upgrading lighting with motion detectors and occupancy sensors, installing or replacing insulation, replacing mechanical ventilation systems with natural ventilation, and installing water conserving toilets.

Integrated sustainable building design is demonstrated at a Weather Forecast Office (WFO) built for the National Weather Service (NWS) in Tlyan, Guam. The facility, located in an area with extreme weather and environmental conditions, is required to operate 24-hours a day, 365-days a year. The facility houses sensitive electronic systems and complex communication equipment necessary to fulfill its critical mission of providing weather data for the region. The design team looked at opportunities to integrate sustain sustainable features as: low maintenance and energy efficient equipment, use of alternate energy resources, waste reduction, use of recycled materials, and optimizing indoor environmental quality. Using DOE 2.1 E Software, a benchmark-model of typical energy use in previous NWS facilities was created. This benchmark was used in analyzing various design and material specification options. The sustainable building design elements incorporated in the WFO include building siting, landscape, maintenance, daylighting, energy efficient sensors, alternate energy resources, indoor air quality measures, and recycled/renewable materials. The steps taken at the WFO facility are expected to result in annual energy cost savings of approximately 22 percent, compared to a typical American Society of Heating, Refrigerating, and Air-Conditioning Engineers-compliant building.

## 4. Highly Efficient Systems

Under Section 403(g) of Executive Order 13123, agencies are to implement district energy systems and other highly efficient systems in new construction or retrofit projects. Agencies are to consider combined cooling, heat, and power when upgrading and assessing facility power needs and survey local natural resources to optimize use of available biomass, bioenergy, geothermal, or other naturally occurring energy sources.

Highly efficient systems are being installed and utilized by nearly every reporting agency. In many cases, agencies are forming ESPCs with energy service companies to install cogeneration, geothermal and biomass systems. In FY 2000 the Army was in the third year of a 5-year, $300 million central boiler plant modernization program. The goals of this program are to update the aging central boiler plant infrastructure that is currently found on many installations. These projects have resulted in upgraded or new boilers, new distribution systems, improved high efficiency pumps and motors, and updated system controls in all of these plants.

Three programs at DOE's Lawrence Livermore National Laboratory (LLNL), Energy Management, Geothermal and Environmental Technologies, and Environmental Remediation, worked together to conceive, develop, evaluate, and advocate a method of extracting energy from an untapped renewable energy resource. This resource is the treated effluent from pollution prevention groundwater remediation pump-and-treat installations. LLNL has successfully

demonstrated the utilization of this resource as condenser water in a nearby building's water-source heat pumps, and, further as irrigation water.

In FY 2000, the National Institutes of Health (NIH), a component of the Department of Health and Human Services, signed a UESC with the local utility to construct a 23-megawatt cogeneration unit that is a prime example of a highly efficient energy system. Another example is under construction at the NIH Clinical Research Center (CRC), and involves the use of steam driven electric generating turbines as a means of conserving steam energy that would otherwise be lost in the normal pressure reducing process.

## 5. Water Conservation

Under Section 207 of Executive Order 13123, agencies are required to reduce water consumption and associated energy use in their facilities to reach the goals set under section 503(f) of the order.

The water conservation goals require agencies to implement life-cycle cost-effective water efficiency programs that include developing a comprehensive water management plan and at least four separate Water Efficiency Improvement Best Management Practices (BMP), as defined in DOE guidance documents. The goals include the following schedule for program implementation in agencies' facilities: 05 percent of facilities by 2002, 15 percent of facilities by 2004, 30 percent of facilities by 2006, 50 percent of facilities by 2008, and 80 percent of facilities by 2010.

FY 2000 water consumption data are used by agencies as baseline usage to measure progress in water conservation efforts. Agencies use actual data where available or develop estimates where actual data are not available. Water usage was reported to the Department of Energy in the FY 2000 annual energy reports. Federal water usage will thereafter be reported every two years beginning in 2002. Water conservation measures implemented and water saved on an annual basis will also be reported.

In FY 2000, all reporting agencies combined consumed nearly 256.4 billion gallons of water at a cost of more than $432 million. It is likely that actual consumption is higher due to under-reporting by agencies. This is the first year that agencies were asked to submit data on water consumption and many agencies are still putting in place accurate systems for capturing this data.

Conservation efforts undertaken by agencies in FY 2000 included the installation or implementation of the following:

- Recycled effluent water,
- Computer control systems programmed to operate wells and pumps,
- Low-flow faucets,
- Ultra-low consumption toilets with electric flush sensors,
- Electric sensor-controlled lavatories,
- Chilled water consumption has been monitored,
- Performed leak detection on distribution systems,
- Reviewed water management operation procedures,

- Minimization of the amount of water used to water lawns and landscapes, and
- Replacement of worn, booster pumps with newer variable speed system.

Water conservation measures not only reduce water use and cost, but also reduce energy consumption (for pumping) and sewage treatment costs. Additionally, water conservation helps to reduce the quantities of wastewater treatment chemicals (most notably chlorine) being released into the environment, and reduces the risk of drawing down aquifers or saltwater intrusion into aquifers.

## G. Renewable Energy

Section 503 of Executive Order 13123 directed the Secretary of Energy in collaboration with the heads of other agencies to develop a goal for increased renewable energy use in the Federal Government. The Renewable Energy Working Group of the Interagency Energy Management Task Force worked with agency and industry representatives to develop an appropriate renewable energy goal and guidance on how to measure progress toward the goal. In July 2000, the Secretary approved a goal that the equivalent of 2.5 percent of electricity consumption from Federal facilities should come from *new* renewable energy sources by 2005. Based on FY 2000 data, the goal is the equivalent of 1,422 gigawatthours (GWh) of electricity. New renewable energy sources were defined as any renewable energy project installed since 1990. Renewable energy includes biomass, geothermal, wind and solar resources as specified in the Executive Order. Hydropower was purposely excluded from the definition in the Executive Order, so it was also excluded from counting toward the renewable energy goal.

Although the goal is measured against Federal electricity consumption, agencies are allowed to substitute other forms of renewable energy; for example, the use of renewable transportation fuels like ethanol or solar hot water heating. FEMP has undertaken a review of Federal renewable energy use and is tracking new installations. The review has found 210 GWh of new renewable energy use in the Federal sector, approximately 15 percent of the goal amount.

FEMP is continuing to work with agencies and the Renewable Working Group to develop strategies for accomplishing this goal, and the goals of the Million Solar Roofs initiative that were included in Section 204 of Executive Order 13123. There are three approaches FEMP is pursuing to meet the goal: 1) increasing the number of renewable energy projects Federal agencies implement, 2) increasing the use of green power from renewable energy through direct purchases or the purchase of "Green Tags" that pay only for the environmental attributes of renewable generation without purchasing the energy, and 3) encouraging agencies to facilitate renewable energy projects that use Federal land and resources, or serve the direct customers of agencies (for example Native Americans served by the Bureau of Indian Affairs).

During FY 2000, FEMP had identified approximately 740 GWh of potential projects agencies are facilitating. This included a major wind power development that was being discussed at the DOE Nevada Test Site (260 MW), a geothermal project at Fallon Naval Air Station in Nevada (30 GW), and multiple photovoltaic and wind systems that the Departments of the Interior and Agriculture are supporting on Native American lands through loan programs and grants.

Another 55 GWh of potential green power or green tag purchases have been identified, and 36 GWh of potential on-site projects.

In order to better track Federal renewable energy use, FEMP, with technical support from NREL, integrated information from the Million Solar Roofs Initiative solar system project registry, Sandia National Laboratory's assessment of solar systems at U.S. Department of the Interior and U.S. Department of Agriculture Forest Service facilities and other disparate data sources into a single database and Web-enabled project registry. During FY 2000, the Internet site for this system was in its testing phase. The database contains information on renewable energy usage at more than 25,000 sites, including information on green power purchases, on-site power generation, and thermal applications. FEMP and NREL are continuing to enter system data into the registry to more accurately reflect a baseline for Federal renewable energy use.

**Million Solar Roofs**

Section 204 of Executive Order 13123 restated a goal of 2,000 solar roof installations in the Federal Government by 2000, and 20,000 installations by 2010. The goal was first articulated in the 1997 announcement of the Million Solar Roofs Initiative. In the period from June 1997 to April 2000 the Federal government installed 1,745 solar energy systems. This total included 1,682 solar hot water systems, 58 photovoltaic power systems and 5 transpired solar thermal collectors. The U.S. Navy installed an additional 1,000 solar hot water systems by the end of FY 2000. This brought total installations to just over 2,700 systems by the end of 2000, accomplishing the Federal goal.

## II. ENERGY MANAGEMENT IN STANDARD BUILDINGS

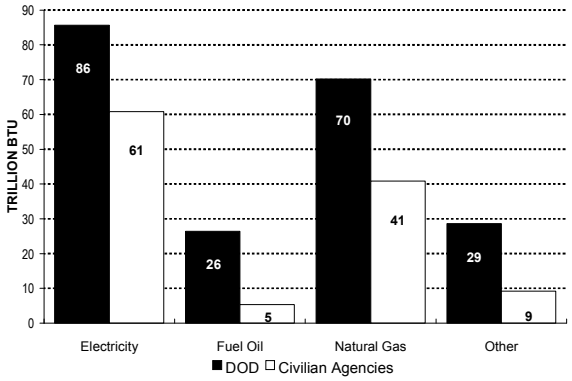
### A. Energy Consumption and Costs for Standard Buildings

During FY 2000, the Federal Government provided energy to approximately 500,000 buildings and facilities comprising approximately 3.4 billion square feet of floor area. Of this, approximately 3.06 billion square feet was reported as standard building space in FY 2000. The remaining space is reported as energy intensive facilities or exempt facilities and is discussed in Sections III and IV respectively. The energy is used in standard buildings provides lighting, heating, ventilation, air conditioning, and other standard building services, and is used for certain process operations that are not reported separately.[12] Federal buildings include both Federally-owned and leased buildings. However, in many instances the lessor pays the energy bill, and consumption and cost data may not be available to the Government. Accordingly, Federal agencies report data for leased space to the maximum extent practicable.[13]

Table 5-A shows the total primary energy consumed in Federal buildings and facilities, including energy resources used to generate, process, and transport electricity and steam.[14] Primary energy consumed in buildings and facilities in FY 2000 decreased 9.1 percent from FY 1985 and 0.7 percent from FY 1999.

Table 5-B shows that agencies have decreased site-delivered energy consumption in buildings by 22.6 percent, from 422.3 trillion Btu in FY 1985 to 326.8 trillion Btu in FY 2000. A comparison to FY 1999 shows a decrease of 2.1 percent in total buildings energy consumption.

**FIGURE 5**
**Defense and Civilian Energy Consumption in Standard Buildings by Fuel Type, FY 2000**




Of the 29 agencies represented on the tables for FY 2000, 11, including DOD, consume approximately 97 percent of the reported buildings energy use. Energy used in buildings accounts for approximately 33.3 percent of the total 0.98 quads used by the Federal Government. The mix of Federal buildings energy use for Defense and civilian agencies is depicted in Figure 5. Electricity

[12]Process energy is that energy used in buildings for operations other than standard building services. In cases where separate reporting was not possible, due to the lack of meters or estimation techniques, process energy was reported as though it was part of the energy used for standard building services.

[13]The General Services Administration (GSA) is the primary leasing agent for the Federal Government, although most of the other agencies do have some leasing authority. In some cases, GSA will delegate operations and maintenance responsibility to individual agencies for leased space, requiring the agency to be responsible for paying the utility bills and reporting energy consumption.

[14]Conversion factors of 10,346 Btu per kilowatt hour for electricity and 1,390 Btu per pound of steam are used to calculate primary energy consumption. See Appendix B for conversion factors for site-delivered energy consumption.

TABLE 5-A

FEDERAL PRIMARY ENERGY CONSUMPTION IN STANDARD BUILDINGS

(In Billions of Btu, with Conversions to Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x $10^{15}$])

| CIVILIAN AGENCY | **FY 1985** | FY 1990 | FY 1991 | FY 1992 | FY 1993 | FY 1994 | FY 1995 | FY 1996 | FY 1997 | FY 1998 | **FY 1999** | **FY 2000** | %Change 85-00 | %Change 99-00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| USPS | **35,915.2** | 42,631.6 | 43,820.8 | 45,472.7 | 49,064.6 | 50,297.9 | 51,256.8 | 53,195.9 | 48,869.8 | 50,939.9 | **52,058.2** | **58,913.2** | 64.0 | 13.2 |
| VA | **39,673.2** | 40,902.8 | 41,915.5 | 41,740.0 | 42,540.0 | 43,113.2 | 43,556.3 | 44,780.8 | 45,068.6 | 45,496.7 | **45,731.8** | **45,527.5** | 14.8 | -0.4 |
| DOE | **53,567.0** | 50,827.2 | 49,154.4 | 52,211.1 | 53,011.7 | 51,148.3 | 49,739.6 | 49,759.9 | 46,277.4 | 45,107.4 | **43,445.8** | **41,629.3** | -22.3 | -4.2 |
| GSA | **36,001.5** | 28,471.0 | 31,461.5 | 31,129.0 | 31,050.0 | 30,558.4 | 29,845.2 | 31,186.6 | 31,339.2 | 31,278.2 | **31,527.5** | **28,241.8** | -21.6 | -10.4 |
| DOJ | **8,531.9** | 8,692.4 | 11,106.3 | 8,464.4 | 11,128.5 | 10,588.5 | 10,996.1 | 13,343.0 | 13,678.7 | 14,132.4 | **14,696.6** | **16,987.3** | 99.1 | 15.6 |
| NASA | **7,995.0** | 9,647.3 | 9,770.6 | 9,621.1 | 9,716.0 | 9,655.0 | 10,189.9 | 10,392.7 | 10,252.1 | 10,266.3 | **9,959.5** | **9,848.7** | 23.2 | -1.1 |
| DOT | **7,857.2** | 6,601.8 | 6,104.4 | 7,677.4 | 7,954.1 | 7,736.2 | 8,377.2 | 8,397.2 | 8,691.9 | 7,865.2 | **7,808.8** | **7,631.1** | -2.9 | -2.3 |
| DOI | **7,879.7** | 6,985.2 | 7,160.1 | 6,270.2 | 7,660.0 | 7,537.0 | 7,028.1 | 5,690.7 | 6,665.0 | 6,862.1 | **6,949.6** | **7,457.8** | -5.4 | 7.3 |
| ST [1] | **6,209.8** | 6,323.1 | 6,347.8 | 747.0 | 119.9 | 212.2 | 230.4 | 706.0 | 6,531.3 | 6,532.6 | **6,173.0** | **6,388.4** | 2.9 | 3.5 |
| USDA | **4,008.4** | 4,937.7 | 5,109.3 | 4,855.2 | 4,985.2 | 4,785.1 | 4,657.8 | 4,831.6 | 4,293.5 | 4,538.2 | **4,045.5** | **4,416.3** | 10.2 | 9.2 |
| DOL | **3,455.8** | 3,603.6 | 3,521.9 | 3,555.5 | 3,681.6 | 3,749.7 | 3,635.3 | 3,756.8 | 3,786.9 | 3,818.4 | **2,986.9** | **3,988.1** | 15.4 | 33.5 |
| TVA | **1,180.5** | 1,260.5 | 1,270.9 | 1,269.4 | 1,308.1 | 1,988.7 | 2,202.4 | 2,133.7 | 2,007.6 | 1,981.0 | **1,959.6** | **1,861.4** | 57.7 | -5.0 |
| TRSY | **1,560.2** | 672.0 | 3,933.6 | 4,350.4 | 3,843.4 | 3,936.9 | 3,399.3 | 3,287.8 | 4,363.8 | 4,126.0 | **4,172.5** | **1,297.3** | -16.8 | -68.9 |
| DOC | **1,092.9** | 855.4 | 2,945.7 | 1,340.6 | 1,499.9 | 1,851.9 | 1,231.1 | 1,190.5 | 1,175.6 | 1,090.5 | **1,125.3** | **1,094.0** | 0.1 | -2.8 |
| HHS | **603.9** | 653.9 | 578.6 | 546.9 | 550.1 | 495.9 | 525.2 | 520.0 | 508.9 | 477.9 | **465.7** | **518.2** | -14.2 | 11.3 |
| HUD | **315.2** | 384.2 | 374.3 | 345.2 | 314.4 | 293.4 | 285.2 | 301.4 | 289.7 | 279.9 | **286.8** | **286.8** | -9.0 | 0.0 |
| FCC | **26.7** | 37.0 | 39.3 | 30.6 | 31.7 | 35.5 | 35.5 | 28.8 | 28.8 | 28.8 | **28.8** | **10.1** | -62.4 | -65.1 |
| PCC | **80.8** | 86.7 | 98.3 | 91.2 | 98.5 | 95.2 | 96.9 | 98.4 | 102.8 | 0.0 | **0.0** | **0.0** | -100.0 | N/A |
| OTHER* | **859.4** | 1,398.8 | 974.4 | 961.2 | 945.5 | 932.2 | 2,772.5 | 4,551.1 | 4,792.4 | 4,568.8 | **4,805.5** | **4,705.9** | 447.6 | -2.1 |
| CIVILIAN AGENCIES TOTAL | **216,814.1** | 214,972.2 | 225,687.9 | 220,679.3 | 229,503.3 | 229,011.3 | 230,060.9 | 238,152.9 | 238,724.1 | 239,390.3 | **238,227.3** | **240,803.2** | 11.1 | 1.1 |
| DOD | **475,614.7** | 541,109.0 | 487,672.6 | 489,972.8 | 486,658.5 | 466,182.5 | 441,755.4 | 419,879.3 | 405,417.0 | 397,287.8 | **395,675.6** | **388,867.4** | -18.2 | -1.7 |
| ALL AGENCIES | **692,428.8** | 756,081.2 | 713,360.5 | 710,652.1 | 716,161.8 | 695,193.8 | 671,816.3 | 658,032.2 | 644,141.1 | 636,678.1 | **633,902.8** | **629,670.6** | -9.1 | -0.7 |
| MBOE | **118.9** | 129.8 | 122.5 | 122.0 | 122.9 | 119.3 | 115.3 | 113.0 | 110.6 | 109.3 | **108.8** | **108.1** | | |
| Petajoules | **730.5** | 797.6 | 752.6 | 749.7 | 755.5 | 733.4 | 708.7 | 694.2 | 679.5 | 671.7 | **668.7** | **664.3** | | |

DATA AS OF 11/30/01

*Other includes for certain years the CFTC, CIA, EEOC, FEMA, FTC, NARA, NSF, NRC, OPM, RRB, SSA, USIA/IBB, and FERC.

Note: This table uses a conversion factor for electricity of 10,346 Btu per kilowatt hour and 1,390 Btu per pound of steam. Contains estimated data for the following agencies: FEMA (1997, 1998), FCC (1997, 1998, 1999), FTC (1997, 1998, 1999), and OPM. (1997, 1998, 1999, 2000). Sum of components may not equal total due to independent rounding.

[1]In 1998, the State Department developed a statistical method for estimating the energy consumption in the large number of foreign buildings it owns and leases. This method was subsequently applied to estimate FY 1991 energy consumption and is now used annually to assess progress. The FY 1991 foreign building estimates were combined with domestic building data for the fiscal years 1985 and 1990, since these are base years for performance goals.

Source: Federal Agency Annual Energy Management Data Reports

TABLE 5-B

FEDERAL SITE-DELIVERED ENERGY CONSUMPTION IN STANDARD BUILDINGS

(In Billions of Btu, with Conversions to Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x $10^{15}$])

| CIVILIAN AGENCY | **FY 1985** | FY 1990 | FY 1991 | FY 1992 | FY 1993 | FY 1994 | FY 1995 | FY 1996 | FY 1997 | FY 1998 | **FY 1999** | **FY 2000** | %Change 85-00 | %Change 99-00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VA | **24,552.0** | 24,380.1 | 24,733.0 | 24,620.0 | 25,077.2 | 25,213.4 | 25,075.4 | 26,172.3 | 26,062.0 | 26,216.9 | **26,134.8** | **26,120.6** | 6.4 | -0.1 |
| USPS | **16,238.3** | 18,480.0 | 18,620.8 | 19,449.2 | 21,159.8 | 21,602.2 | 21,649.7 | 22,210.0 | 22,006.4 | 22,683.9 | **23,127.0** | **25,238.3** | 55.4 | 9.1 |
| DOE | **32,757.8** | 29,149.5 | 28,077.6 | 29,564.3 | 30,546.8 | 29,193.0 | 28,011.6 | 25,987.3 | 23,746.2 | 23,126.7 | **21,730.4** | **20,611.8** | -37.1 | -5.1 |
| GSA | **15,897.7** | 11,174.5 | 13,116.3 | 13,061.4 | 13,075.2 | 12,832.9 | 12,366.7 | 13,439.4 | 13,353.7 | 13,123.7 | **13,083.9** | **11,728.0** | -26.2 | -10.4 |
| DOJ | **6,112.0** | 4,863.8 | 5,894.3 | 3,869.2 | 6,245.8 | 6,143.9 | 6,303.9 | 7,490.6 | 8,003.7 | 7,783.0 | **8,047.1** | **9,374.6** | 53.4 | 16.5 |
| NASA | **3,781.0** | 4,383.3 | 4,342.8 | 4,290.7 | 4,235.7 | 4,161.0 | 4,383.6 | 4,438.1 | 4,350.9 | 4,404.9 | **4,304.0** | **4,280.7** | 13.2 | -0.5 |
| DOI | **4,762.4** | 4,039.4 | 3,886.2 | 3,173.4 | 3,974.3 | 3,922.1 | 3,596.3 | 2,979.1 | 3,668.5 | 3,747.4 | **3,794.6** | **4,006.6** | -15.9 | 5.6 |
| DOT | **4,561.2** | 3,750.4 | 3,297.6 | 3,918.0 | 3,886.6 | 3,903.0 | 3,912.2 | 3,961.1 | 3,870.3 | 3,691.4 | **3,735.2** | **3,608.8** | -20.9 | -3.4 |
| ST[1] | **2,756.9** | 2,792.5 | 2,799.0 | 273.8 | 45.3 | 82.9 | 92.9 | 289.2 | 2,894.1 | 2,893.3 | **3,012.2** | **2,892.7** | 4.9 | -4.0 |
| DOL | **2,153.0** | 2,137.1 | 2,044.1 | 2,063.7 | 2,145.8 | 2,158.3 | 2,028.8 | 2,153.9 | 2,153.9 | 2,190.2 | **1,697.9** | **2,111.8** | -1.9 | 24.4 |
| USDA | **2,096.3** | 2,363.0 | 2,342.4 | 2,151.6 | 2,234.8 | 2,164.5 | 2,083.1 | 2,261.3 | 1,996.0 | 2,111.1 | **1,901.8** | **2,052.5** | -2.1 | 7.9 |
| TVA | **402.4** | 427.8 | 426.6 | 425.6 | 439.8 | 664.0 | 748.5 | 728.4 | 665.6 | 658.4 | **650.8** | **617.7** | 53.5 | -5.1 |
| TRSY | **713.4** | 396.0 | 1,494.7 | 1,749.1 | 1,568.0 | 1,624.7 | 1,418.3 | 1,484.9 | 1,904.4 | 1,741.2 | **1,815.0** | **530.0** | -25.7 | -70.8 |
| DOC | **540.3** | 399.4 | 1,406.9 | 531.0 | 571.9 | 752.9 | 494.9 | 490.1 | 457.2 | 429.9 | **449.4** | **437.0** | -19.1 | -2.8 |
| HHS | **253.0** | 273.1 | 224.5 | 215.8 | 214.1 | 172.1 | 201.7 | 204.7 | 200.1 | 188.8 | **184.8** | **212.3** | -16.1 | 14.8 |
| HUD | **116.9** | 140.3 | 132.2 | 123.1 | 116.2 | 113.5 | 105.9 | 115.4 | 109.3 | 103.1 | **106.3** | **106.3** | -9.1 | 0.0 |
| FCC | **11.2** | 14.8 | 14.9 | 12.4 | 12.9 | 14.1 | 14.1 | 12.8 | 12.8 | 12.8 | **12.8** | **5.1** | -54.6 | -60.3 |
| PCC | **26.6** | 28.6 | 32.4 | 30.1 | 32.5 | 31.4 | 31.9 | 32.4 | 33.9 | 0.0 | **0.0** | **0.0** | -100.0 | N/A |
| OTHER* | **369.0** | 616.7 | 421.6 | 429.6 | 426.0 | 403.9 | 1,189.7 | 1,884.6 | 1,989.1 | 1,898.7 | **1,969.9** | **1,941.2** | 426.1 | -1.5 |
| CIVILIAN AGENCIES TOTAL | **118,101.4** | 109,810.3 | 113,307.9 | 109,951.7 | 116,008.6 | 115,153.9 | 113,708.9 | 116,335.5 | 117,478.1 | 117,005.2 | **115,757.8** | **115,876.1** | -1.9 | 0.1 |
| DOD | **304,190.0** | 321,101.6 | 286,885.7 | 295,719.8 | 279,726.5 | 262,661.5 | 247,166.9 | 235,688.1 | 227,070.0 | 220,567.6 | **217,958.2** | **210,965.0** | -30.6 | -3.2 |
| ALL AGENCIES | **422,291.4** | 430,911.9 | 400,193.6 | 405,671.4 | 395,735.1 | 377,815.4 | 360,875.9 | 352,023.7 | 344,548.1 | 337,572.8 | **333,715.9** | **326,841.1** | -22.6 | -2.1 |
| MBOE | **72.5** | 74.0 | 68.7 | 69.6 | 67.9 | 64.9 | 62.0 | 60.4 | 59.1 | 58.0 | **57.3** | **56.1** | | |
| Petajoules | **445.5** | 454.6 | 422.2 | 428.0 | 417.5 | 398.6 | 380.7 | 371.4 | 363.5 | 356.1 | **352.1** | **344.8** | | |

DATA AS OF 11/30/01

*Other includes for certain years the CFTC, CIA, EEOC, FEMA, FTC, NARA, NSF, NRC, OPM, RRB, SSA, USIA/IBB, and FERC.

Note: This table uses a conversion factor for electricity of 3,412 Btu per kilowatt hour. Contains estimated data for the following agencies: FEMA (1997, 1998), FCC (1997, 1998, 1999), FTC (1997, 1998, 1999), and OPM. (1997, 1998, 1999, 2000). Sum of components may not equal total due to independent rounding.

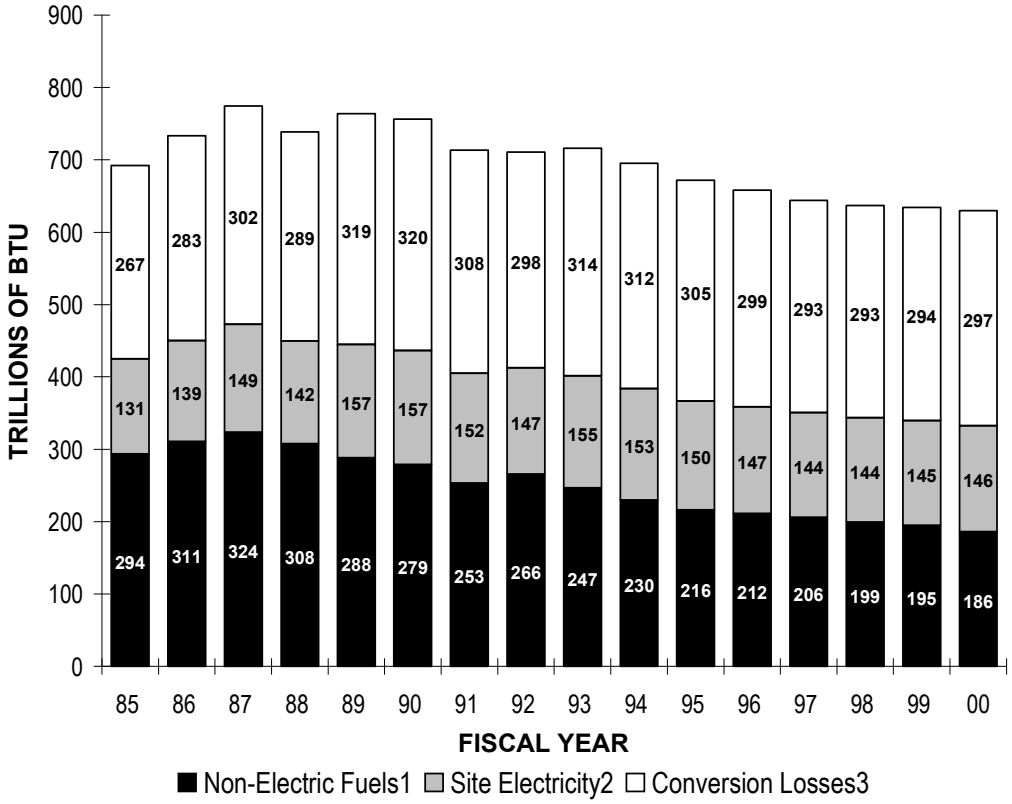
[1]In 1998, the State Department developed a statistical method for estimating the energy consumption in the large number of foreign buildings it owns and leases. This method was subsequently applied to estimate FY 1991 energy consumption and is now used annually to assess progress. The FY 1991 foreign building estimates were combined with domestic building data for the fiscal years 1985 and 1990, since these are base years for performance goals.

Source: Federal Agency Annual Energy Management Data Reports

constitutes 44.7 percent (146.2 trillion Btu) of Federal buildings energy use; 33.9 percent is accounted for by natural gas (110.8 trillion Btu), and 9.7 percent by fuel oil (31.8 trillion Btu). Coal, purchased steam, liquefied petroleum gas (LPG)/propane, and energy reported as "other" (comprised mainly of chilled water), account for the remaining 11.6 percent.

Figure 6 illustrates the proportion of energy consumption in buildings and facilities that is attributable to electricity for FY 1985 through FY 2000. The figure also breaks out the amount of Btu lost through the generation and transmission processes and amount of Btu delivered to the site. In FY 2000, electricity consumption, including energy used at the source of generation,

**FIGURE 6**
**Consumption of Electricity and Other Fuels in Standard Buildings, FY 1985 through FY 2000**




[1]Includes Fuel Oil, Natural Gas, LPG/Propane, Coal, Purchased Steam, and Other. Uses a conversion factor for steam of 1,390 Btu per pound (source conversion).

[2]Uses a conversion factor of 3,412 Btu per kilowatt hour. Amount of energy which reaches the site of use when generation and transmission losses are subtracted.

[3]Amount of energy lost through generation and transmission processes. When added to amount of energy reaching the point of use, the total equals amount of Btu consumed at the source. The source conversion factor is 10,346 Btu per kilowatt hour.

Source: Federal Agency Annual Energy Management Data Reports

accounted for approximately 70.4 percent (443,296.3 billion Btu) of the total primary Btu used in buildings and facilities (629,670.6 billion Btu; see Table 5-A). Of this amount, 33.0 percent or 146.2 trillion Btu reached the site of use. The remaining 67.0 percent, 297.1 trillion Btu, was lost during the generation and transmission processes. Decreases in consumption relative to FY 1999 were seen in fuel oil (7.3 percent), natural gas (5.7 percent), and purchased steam (6.5 percent). Increases from the previous year were seen in electricity (1.0 percent), coal (7.0 percent), LPG/propane (4.1 percent), and in fuels reported under the category of "other" (33.3 percent).

The mix of fuels consumed by Government buildings has changed notably from FY 1985 through FY 2000. The actual consumption of electricity in FY 2000 increased 11.2 percent since FY 1985. The proportion of energy consumed in Federal buildings and facilities that is electricity has increased from 31.1 percent in FY 1985 to 44.7 percent in FY 2000. Over the same period, fuel oil use decreased from 22.3 percent of the total in FY 1985 to only 9.7 percent in FY 2000. The portion of the Federal buildings fuel mix comprised by natural gas has increased from 30.6 percent in FY 1985 to 33.9 percent in FY 2000. The use of coal as a fuel source, which accounted for 12.4 percent of the total energy consumed in FY 1985, has declined to 5.9 percent of the total in FY 2000. Contributing to this has been the practice of agencies, such as DOE, to purchase steam rather than generating their own in coal-fired plants.

As shown in Table 6 the consumption of petroleum-based fuels in buildings during FY 2000 decreased 65.1 percent compared to FY 1985 and 6.7 percent from FY 1999. Efforts by agencies to utilize natural gas as a cost-effective substitute for petroleum-based fuels in buildings, as well as conservation of fuel oil and LPG/propane in buildings contributed to these reductions. Petroleum fuel consumption in buildings during FY 2000 represented only 10.4 percent of all energy consumed in Federal buildings. Of this amount, 93.6 percent is attributed to fuel oil and the remaining 6.4 percent to LPG/propane.

The energy used in buildings in FY 2000 accounted for approximately 46.0 percent of the total Federal energy bill. Tables 7-A and 7-B show that the Federal Government spent approximately $3,390.2 million for buildings energy during the fiscal year, a decrease in constant dollars of approximately $61.3 million from FY 1999 expenditures. The combined cost of buildings energy in FY 2000 was $10.37 per million Btu, up 0.3 percent from the combined cost of $10.34 reported in FY 1999.

Figure 7 illustrates energy expenditures for buildings and facilities from FY 1985 through FY 2000. In constant 2000 dollars, Federal energy costs for buildings and facilities decreased 35.3 percent from $5,240.7 million in FY 1985 to $3,390.2 million in FY 2000. The combined cost for buildings energy in constant dollars in FY 2000 was $10.39 per million Btu, down 16.4 percent from $12.41 per million Btu in FY 1985.

**FIGURE 7**
**Energy Costs in Standard Buildings**
**FY 1985 through FY 2000**

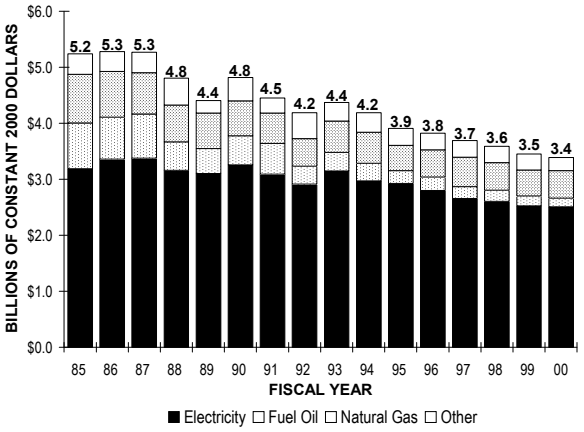


TABLE 6
PETROLEUM-BASED FUEL* CONSUMPTION IN STANDARD BUILDINGS
(In Billions of Btu)

| CIVILIAN AGENCY | **FY 1985** | FY 1990 | FY 1991 | FY 1992 | FY 1993 | FY 1994 | FY 1995 | FY 1996 | FY 1997 | FY 1998 | **FY 1999** | **FY 2000** | %Change 85-00 | %Change 99-00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DOD | **84,366.6** | 69,030.1 | 59,451.5 | 65,654.1 | 55,585.9 | 50,285.7 | 42,939.0 | 42,861.7 | 35,214.4 | 32,354.5 | **30,506.7** | **27,982.5** | -66.8 | -8.3 |
| VA | **2,176.7** | 2,219.3 | 1,404.9 | 1,506.0 | 1,533.9 | 1,827.4 | 1,292.9 | 2,098.2 | 1,186.3 | 954.6 | **954.8** | **1,045.4** | -52.0 | 9.5 |
| USPS | **1,673.2** | 1,502.2 | 1,219.4 | 1,195.8 | 988.8 | 983.7 | 813.9 | 595.2 | 819.0 | 1,139.4 | **821.7** | **857.9** | -48.7 | 4.4 |
| DOT | **2,376.9** | 1,524.1 | 1,308.4 | 1,426.0 | 854.0 | 1,001.6 | 911.7 | 709.2 | 670.5 | 816.8 | **823.9** | **814.7** | -65.7 | -1.1 |
| ST | **817.8** | 817.8 | 817.8 | 0.0 | 0.0 | 0.0 | 0.0 | 21.8 | 706.0 | 706.0 | **1,098.0** | **774.2** | -5.3 | -29.5 |
| DOE | **1,650.8** | 1,900.5 | 2,063.7 | 2,042.7 | 1,943.5 | 1,924.4 | 1,973.5 | 1,554.1 | 1,394.0 | 1,174.5 | **646.5** | **769.1** | -53.4 | 19.0 |
| DOI | **1,591.6** | 1,273.9 | 1,141.1 | 919.1 | 1,181.9 | 1,560.6 | 1,574.3 | 1,177.7 | 799.6 | 964.7 | **835.1** | **996.7** | -37.4 | 19.4 |
| DOL | **437.8** | 331.2 | 258.3 | 263.6 | 276.1 | 277.5 | 210.8 | 220.6 | 254.2 | 226.1 | **188.9** | **193.2** | -55.9 | 2.3 |
| DOJ | **381.7** | 371.6 | 503.7 | 383.8 | 250.8 | 234.8 | 182.8 | 234.3 | 134.9 | 103.1 | **115.0** | **129.5** | -66.1 | 12.7 |
| NASA | **334.1** | 495.6 | 428.4 | 449.0 | 318.4 | 291.8 | 166.8 | 132.2 | 83.6 | 100.0 | **88.4** | **77.7** | -76.7 | -12.0 |
| GSA | **944.2** | 668.1 | 443.1 | 418.2 | 359.4 | 379.8 | 199.0 | 242.3 | 143.0 | 54.8 | **68.4** | **68.2** | -92.8 | -0.3 |
| TRSY | **22.5** | 138.4 | 127.7 | 84.2 | 190.5 | 160.8 | 116.6 | 116.2 | 57.0 | 44.8 | **60.3** | **64.3** | 186.4 | 6.8 |
| CIA | **0.0** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 49.6 | 87.9 | 84.6 | 60.2 | **53.6** | **57.0** | 0.0 | 6.3 |
| FEMA | **56.7** | 72.3 | 59.1 | 66.9 | 67.6 | 49.1 | 49.1 | 49.1 | 49.1 | 49.1 | **30.6** | **32.2** | -43.2 | 5.3 |
| USDA | **414.2** | 260.0 | 291.3 | 242.9 | 255.6 | 236.3 | 244.1 | 242.5 | 272.2 | 270.6 | **114.1** | **122.8** | -70.4 | 7.6 |
| DOC | **130.3** | 22.5 | 13.1 | 9.8 | 23.8 | 52.4 | 10.8 | 33.4 | 9.3 | 8.7 | **6.1** | **5.3** | -95.9 | -12.6 |
| SSA | **0.0** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.2 | 11.8 | 8.9 | **3.5** | **3.4** | N/A | -3.2 |
| TVA | **4.2** | 3.2 | 0.1 | 1.3 | 2.7 | 3.5 | 3.9 | 4.1 | 0.0 | 3.0 | **2.9** | **1.9** | -55.3 | -34.8 |
| FCC | **1.7** | 1.9 | 1.0 | 1.3 | 1.3 | 1.3 | 1.3 | 1.7 | 1.7 | 1.7 | **1.7** | **0.2** | -91.2 | -91.3 |
| HHS | **34.5** | 39.3 | 29.8 | 34.5 | 31.3 | 0.0 | 0.0 | 2.9 | 1.9 | 1.9 | **1.9** | **0.0** | -100.0 | -100.0 |
| EEOC | **0.0** | 1.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | **0.0** | **0.0** | N/A | N/A |
| NSF | **19.4** | 9.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | **0.0** | **0.0** | -100.0 | N/A |
| USIA/IBB | **0.0** | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | **0.0** | **0.0** | N/A | N/A |
| TOTAL | **97,435.0** | 80,683.4 | 69,562.2 | 74,699.6 | 63,865.5 | 59,270.7 | 50,740.0 | 50,393.3 | 41,893.3 | 39,043.6 | **36,421.9** | **33,996.3** | -65.1 | -6.7 |

DATA AS OF 11/30/01

*Petroleum-based fuels include fuel oil and LPG/propane.
Note: Contains estimated data for the following agencies: FEMA (1997, 1998), FCC (1997, 1998, 1999), FTC (1997, 1998, 1999), and OPM. (1997, 1998, 1999, 2000).
Sum of components may not equal total due to independent rounding.
[1]In 1998, the State Department developed a statistical method for estimating the energy consumption in the large number of foreign buildings it owns and leases. This method was subsequently applied to estimate FY 1991 energy consumption and is now used annually to assess progress. The FY 1991 foreign building estimates were combined with domestic building data for the fiscal years 1985 and 1990, since these are base years for performance goals.

Source: Federal Agency Annual Energy Management Data Reports

# TABLE 7-A
# DEFENSE AND CIVILIAN FEDERAL COSTS FOR STANDARD BUILDINGS ENERGY IN FY 2000
## (In Millions of Dollars)

| | ELECTRICITY | FUEL OIL | NATURAL GAS | LPG/ PROPANE | COAL | PURCHASED STEAM | OTHER | TOTAL |
|---|---|---|---|---|---|---|---|---|
| DEFENSE | 1,441.793 | 120.958 | 303.670 | 12.424 | 35.036 | 117.777 | 0.604 | 2,032.261 |
| CIVILIAN | 1,067.849 | 33.734 | 186.258 | 5.188 | 4.199 | 52.832 | 7.844 | 1,357.905 |
| TOTAL | 2,509.642 | 154.692 | 489.928 | 17.611 | 39.235 | 170.609 | 8.449 | 3,390.166 |

AVERAGE COST PER UNIT, BASED ON REPORTS FROM AGENCIES

| | | | |
|---|---|---|---|
| ELECTRICITY | = | 58.57 | / MWH |
| FUEL OIL | = | 0.67 | / GALLON |
| NATURAL GAS | = | 4.56 | / THOUSAND CUBIC FEET |
| LPG/PROPANE | = | 0.77 | / GALLON |
| COAL | = | 50.36 | / SHORT TON |
| PURCHASED STEAM | = | 11.62 | / MILLION BTU |
| OTHER | = | 4.17 | / MILLION BTU |

DATA AS OF 11/30/01

Note: Contains estimated data for the following agencies: NSF and OPM.
Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports.

# TABLE 7-B
# CONSUMPTION AND COSTS OF FEDERAL BUILDINGS ENERGY BY FUEL TYPE IN FY 2000, FY 1999, AND FY 1985
## (Constant 2000 Dollars)

| ENERGY TYPE | BILLIONS OF BTU | COST PER MMBTU | COST (IN MILLIONS OF DOLLARS) |
|---|---|---|---|
| **FY 2000** | | | |
| ELECTRICITY | 146,194.4 | 17.1665 | 2,509.640 |
| FUEL OIL | 31,811.0 | 4.8628 | 154.692 |
| NATURAL GAS | 110,787.8 | 4.4222 | 489.928 |
| LPG/PROPANE | 2,185.2 | 8.0593 | 17.611 |
| COAL | 19,151.8 | 2.0486 | 39.235 |
| PURCHASED STEAM | 14,686.1 | 11.6171 | 170.609 |
| OTHER | 2,024.8 | 4.1725 | 8.449 |
| TOTAL | 326,841.1 | | 3,390.170 |
| AVERAGE COST PER MMBTU = $10.373 | | | |
| **FY 1999** | | | |
| ELECTRICITY | 144,699.4 | 17.4684 | 2,527.669 |
| FUEL OIL | 34,322.6 | 5.0960 | 174.907 |
| NATURAL GAS | 117,468.9 | 3.9714 | 466.521 |
| LPG/PROPANE | 2,099.4 | 8.8344 | 18.547 |
| COAL | 17,906.9 | 2.1151 | 37.876 |
| PURCHASED STEAM | 15,700.1 | 13.8309 | 217.147 |
| OTHER | 1,518.7 | 5.7884 | 8.791 |
| TOTAL | 333,715.9 | | 3,451.459 |
| AVERAGE COST PER MMBTU = $10.343 | | | |
| **FY 1985** | | | |
| ELECTRICITY | 131,475.4 | 24.2720 | 3,191.167 |
| FUEL OIL | 94,258.3 | 8.6595 | 816.234 |
| NATURAL GAS | 129,222.5 | 6.7038 | 866.280 |
| LPG/PROPANE | 3,176.6 | 10.0444 | 31.907 |
| COAL | 52,397.2 | 3.3700 | 176.581 |
| PURCHASED STEAM | 7,558.8 | 17.0447 | 128.837 |
| OTHER | 4,202.6 | 7.0538 | 29.644 |
| TOTAL | 422,291.4 | | 5,240.650 |
| AVERAGE COST PER MMBTU = $12.411 | | | |

DATA AS OF 11/30/01

Note: FY 1999 contains estimated data for: FCC, FTC, and OPM.
FY 2000 contains estimated data for: NSF and OPM.

This table uses a conversion factor for electricity of 3,412 Btu per kilowatt hour. Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

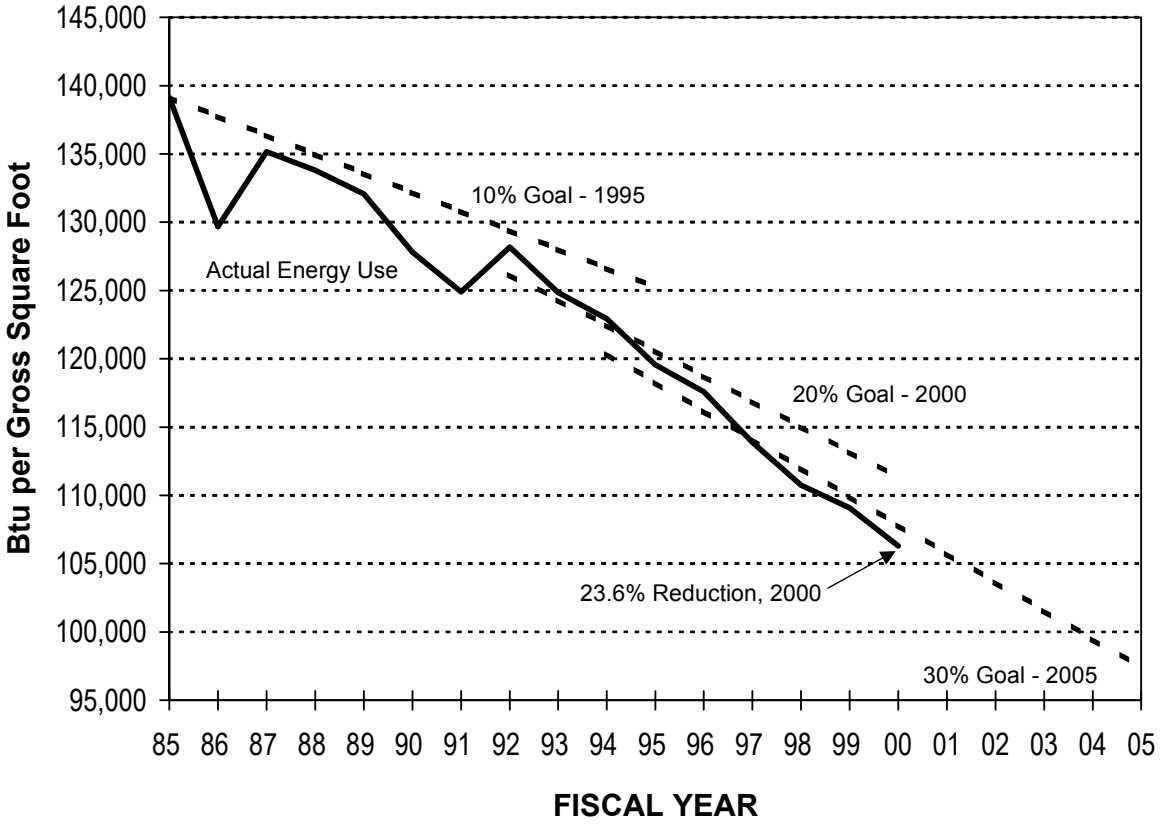
Electricity costs of $2,509.6 million represent approximately 74.0 percent of total expenditures of $3,390.2 million for buildings energy in FY 2000. Natural gas costs account for approximately 14.5 percent of the total, expenditures for fuel oil account for 4.6 percent, with the remaining 7.0 percent attributable to expenditures for LPG/propane, coal, purchased steam, and "other."

In FY 2000, the cost of all energy used in Federal buildings was $1.11 per gross square foot. Of the $1.11 spent per square foot Government-wide, $0.82 was spent for electricity, $0.16 was spent for natural gas, $0.05 was spent for fuel oil, and the remaining $0.08 was spent for purchased steam, coal, LPG/propane, and other fuels.

## B. Progress Toward the Mandated Goals for Buildings and Facilities

Both the magnitude of energy consumption and the potential for energy savings have prompted legislative and executive branch initiatives to achieve energy conservation in the Federal buildings sector.[15] Federal Government progress toward the 10, 20, and 30 percent energy reduction goals of NECPA and Executive Order 13123 is illustrated in Figure 8.

**FIGURE 8**
**Progress Toward the Energy Reduction Goals for Federal Standard Buildings**
**FY 1985 through FY 2000**




[15]The legislative authorities for Federal agencies are detailed in Appendix A.

(Executive Order 13123 also establishes a 35 percent reduction goal for 2010.) Overall, the Federal Government reduced its site-delivered energy consumption in buildings and facilities by 23.6 percent in FY 2000 compared to FY 1985 when measured in terms of British Thermal Units consumed per gross square foot (Btu/GSF) of floor area.

Table 8-A shows the FY 2000 performance of the individual agencies in site-delivered Btu/GSF compared to FY 1985. Site-delivered Btu reflects the amount of energy delivered to the point of use and is used to measure agency performance toward the mandated goals.

Table 8-B shows the performance of the agencies measured in terms of primary Btu/GSF. Primary Btu represents the average amount of energy required at the source of generation (primary energy) rather than the actual Btu delivered to the site. Primary Btu includes energy resources used to generate, process, and transport electricity and steam. Measured in terms of source energy, the Federal Government shows a reduction of 9.9 percent in FY 2000 compared to FY 1985. This large difference from the site-delivered Btu/GSF reduction of 23.6 percent reflects the significant declines in direct use of fossil fuels and the offsetting increases in the share of the fuel mix contributed by electricity.

Contributing to the overall reduction of 23.6 percent in site-delivered Btu/GSF were the percentage reductions greater than 20 percent made by the following nine agencies: the Departments of Agriculture, Commerce, Defense, Energy, Justice, Transportation, GSA, the National Aeronautics and Space Administration, and the Tennessee Valley Authority. The progress of each agency toward the goal for standard buildings is illustrated in Figure 9.

The Social Security Administration is shown in the Figure 9 with an increase in Btu/GSF of 9.4 percent (-9.4 percent reduction). This is based on a base year of FY 1996 rather than FY 1985, since SSA was not delegated control of all of its buildings until that date. (Because of this SSA's data for FY 2000 is included in the "Other" line in Tables 8-A and 8-B.) SSA's Btu/GSF rose from 87,367 in FY 1996 to 95,565 in FY 2000 for its 8.8 million square feet of space.

The agencies used a variety of strategies to reduce their energy consumption. Operations and maintenance (O&M) procedures continued to be emphasized as a major component in the effort to achieve the energy reduction goals. Improvements in energy efficiency were achieved through improved energy systems operations and both preventive maintenance and improved maintenance. O&M funding, used for the replacement of boilers, HVAC equipment, windows, and lighting systems, continued to benefit energy conservation.

In FY 2000, the implementation of many no-cost and low-cost energy conservation measures was continued, such as reducing lighting levels, lowering hot water temperatures, turning off unused equipment, and installing energy-efficient windows, insulation, weather stripping, and set-back thermometers.

# TABLE 8-A
# FEDERAL STANDARD BUILDINGS SITE-DELIVERED ENERGY USE PER GROSS SQUARE FOOT, FY 1985 AND FY 2000

| | FISCAL YEAR 1985 | | | FISCAL YEAR 2000 | | | |
|---|---|---|---|---|---|---|---|
| | GSF (Thousands) | BTU (Billions) | **BTU/GSF** | GSF (Thousands) | BTU (Billions) | **BTU/GSF** | %CHANGE 1985-2000 |
| VA | 123,650.0 | 24,552.0 | **198,560** | 155,445.0 | 26,120.6 | **168,037** | -15.4 |
| USPS | 189,400.0 | 16,238.3 | **85,736** | 339,707.2 | 25,238.3 | **74,194†** | -13.5 |
| DOE | 73,836.1 | 32,757.8 | **443,656** | 82,454.0 | 20,611.8 | **249,969†** | -43.7 |
| GSA | 189,976.9 | 15,897.7 | **83,682** | 175,535.6 | 11,728.0 | **66,791†** | -20.2 |
| DOJ | 20,768.8 | 6,112.0 | **294,289** | 53,714.5 | 9,374.6 | **174,527** | -40.7 |
| NASA | 14,817.5 | 3,781.0 | **255,171** | 21,104.1 | 4,280.7 | **202,838** | -20.5 |
| DOI | 54,154.4 | 4,762.4 | **87,940** | 51,535.8 | 4,006.6 | **77,720†** | -11.6 |
| DOT | 32,312.4 | 4,561.2 | **141,158** | 36,160.3 | 3,608.8 | **99,800** | -29.3 |
| ST | 44,674.4 | 2,756.9 | **61,711** | 47,642.4 | 2,892.7 | **60,717** | -1.6 |
| DOL | 18,268.3 | 2,153.0 | **117,852** | 20,503.5 | 2,111.8 | **102,999** | -12.6 |
| USDA | 24,709.9 | 2,096.3 | **84,837** | 31,404.0 | 2,052.5 | **65,259†** | -23.1 |
| TVA | 4,886.6 | 402.4 | **82,357** | 10,286.9 | 617.7 | **59,995†** | -27.2 |
| TRSY | 7,182.6 | 713.4 | **99,317** | 6,065.4 | 530.0 | **87,384** | -12.0 |
| DOC | 4,522.6 | 540.3 | **119,476** | 5,545.1 | 437.0 | **78,814** | -34.0 |
| HHS | 2,649.8 | 253.0 | **95,491** | 2,692.8 | 212.3 | **78,829** | -17.4 |
| HUD | 1,432.0 | 116.9 | **81,668** | 1,432.0 | 106.3 | **74,235** | -9.1 |
| OTHER* | 3,172.0 | 406.8 | **128,249** | 15,692.7 | 1,946.3 | **124,025** | -3.3 |
| CIVILIAN AGENCIES TOTAL | 810,414.3 | 118,101.4 | **145,730** | 1,056,921.3 | 115,876.1 | **109,594†** | -24.8 |
| DOD | 2,224,527.3 | 304,190.0 | **136,744** | 2,004,828.5 | 210,965.0 | **104,543†** | -23.5 |
| TOTAL | 3,034,941.6 | 422,291.4 | **139,143** | 3,061,749.8 | 326,841.1 | **106,287†** | -23.6 |

DATA AS OF 11/30/01

*Other includes the Federal Communications Commission, Federal Trade Commission, Federal Emergency Management Agency, National Archives and Records Administration, National Science Foundation, Nuclear Regulatory Commission, Office of Personnel Management, Panama Canal Commission, Railroad Retirement Board, Social Security Administration, the U.S. Information Agency, and the Federal Energy Regulatory Commission.

†Indicates where reductions were made to Btu/GSF to reflect purchases of renewable energy. When calculating Btu/GSF, the following amounts were subtracted from agency energy use shown above for FY 2000: DOD, 1,373.4 BBtu; USPS, 34.1 BBtu; DOE, 0.9 BBtu; GSA, 3.8 BBtu; DOI, 1.2 BBtu; USDA, 3.1 BBtu; and TVA, 0.5 BBtu.

Note: This table uses a conversion factor for electricity of 3,412 Btu per kilowatt hour.
Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

# TABLE 8-B
# FEDERAL STANDARD BUILDINGS PRIMARY ENERGY USE PER GROSS SQUARE FOOT, FY 1985 AND FY 2000

| | FISCAL YEAR 1985 | | | FISCAL YEAR 2000 | | | |
|---|---|---|---|---|---|---|---|
| | GSF (Thousands) | BTU (Billions) | **BTU/GSF** | GSF (Thousands) | BTU (Billions) | **BTU/GSF** | %CHANGE 1985-2000 |
| USPS | 189,400.0 | 35,915.2 | **189,626** | 339,707.2 | 58,913.2 | **173,423** | -8.5 |
| VA | 123,650.0 | 39,673.2 | **320,851** | 155,445.0 | 45,527.5 | **292,885** | -8.7 |
| DOE | 73,836.1 | 53,567.0 | **725,485** | 82,454.0 | 41,629.3 | **504,879** | -30.4 |
| GSA | 189,976.9 | 36,001.5 | **189,504** | 175,535.6 | 28,241.8 | **160,889** | -15.1 |
| DOJ | 20,768.8 | 8,531.9 | **410,805** | 53,714.5 | 16,987.3 | **316,253** | -23.0 |
| NASA | 14,817.5 | 7,995.0 | **539,563** | 21,104.1 | 9,848.7 | **466,672** | -13.5 |
| DOT | 32,312.4 | 7,857.2 | **243,165** | 36,160.3 | 7,631.1 | **211,036** | -13.2 |
| DOI | 54,154.4 | 7,879.7 | **145,504** | 51,535.8 | 7,457.8 | **144,710** | -0.5 |
| ST | 44,674.4 | 6,209.8 | **139,002** | 47,642.4 | 6,388.4 | **134,090** | -3.5 |
| USDA | 24,709.9 | 4,008.4 | **162,218** | 31,404.0 | 4,416.3 | **140,629** | -13.3 |
| DOL | 18,268.3 | 3,455.8 | **189,167** | 20,503.5 | 3,988.1 | **194,507** | 2.8 |
| TVA | 4,886.6 | 1,180.5 | **241,575** | 10,286.9 | 1,861.4 | **180,951** | -25.1 |
| TRSY | 7,182.6 | 1,560.2 | **217,217** | 6,065.4 | 1,297.3 | **213,889** | -1.5 |
| DOC | 4,522.6 | 1,092.9 | **241,648** | 5,545.1 | 1,094.0 | **197,292** | -18.4 |
| HHS | 2,649.8 | 603.9 | **227,888** | 2,692.8 | 518.2 | **192,434** | -15.6 |
| HUD | 1,432.0 | 315.2 | **220,090** | 1,432.0 | 286.8 | **200,300** | -9.0 |
| OTHER* | 3,172.0 | 966.9 | **304,811** | 15,692.7 | 4,716.0 | **300,520** | -1.4 |
| CIVILIAN AGENCIES TOTAL | 810,414.3 | 216,814.1 | **267,535** | 1,056,921.3 | 240,803.2 | **227,835** | -14.8 |
| DOD | 2,224,527.3 | 475,614.7 | **213,805** | 2,004,828.5 | 388,867.4 | **193,965** | -9.3 |
| TOTAL | 3,034,941.6 | 692,428.8 | **228,152** | 3,061,749.8 | 629,670.6 | **205,657** | -9.9 |

DATA AS OF 11/30/01

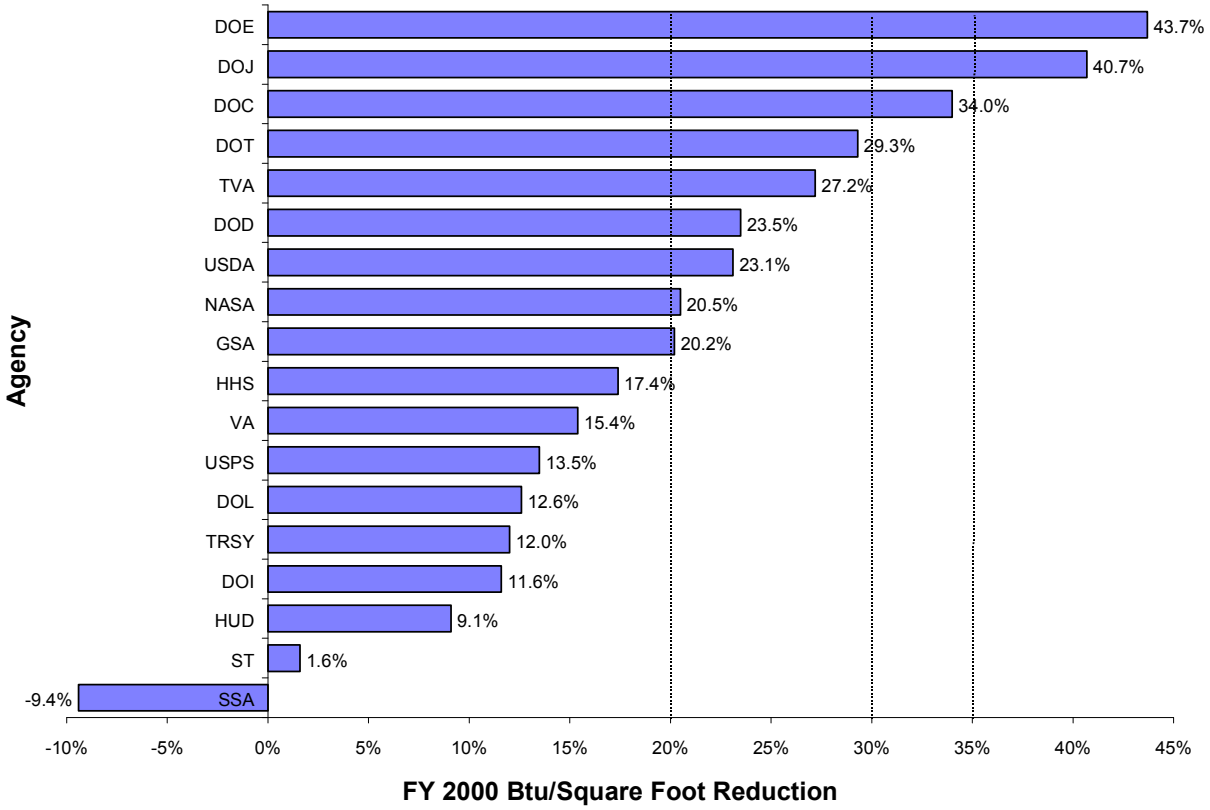
*Other includes the Federal Communications Commission, Federal Trade Commission, Federal Emergency Management Agency, National Archives and Records Administration, National Science Foundation, Nuclear Regulatory Commission, Office of Personnel Management, Panama Canal Commission, Railroad Retirement Board, Social Security Administration, the U.S. Information Agency, and the Federal Energy Regulatory Commission.

Note: This table uses a conversion factor for electricity of 10,346 Btu per kilowatt hour and 1,390 Btu per pound of steam. Sum of components may not equal total due to independent rounding.

[1]In 1998, the State Department developed a statistical method for estimating the energy consumption in the large number of foreign buildings it owns and leases. This method was subsequently applied to estimate FY 1991 energy consumption and is now used annually to assess progress. The FY 1991 foreign building estimates were combined with domestic building data for the fiscal years 1985 and 1990, since these are base years for performance goals.

Source: Federal Agency Annual Energy Management Data Reports

**FIGURE 9**
**Progress of Individual Agencies Toward the Federal Reduction Goal for Standard Buildings**
**FY 2000 Compared to FY 1985**




Numerous energy-efficient building retrofits and energy conservation projects were undertaken to supplement the no-cost, low-cost measures. These initiatives can be categorized by lighting system replacement, HVAC equipment modernization, building envelope improvements, and other miscellaneous projects, such as installation of energy management control systems. Utility-sponsored demand side management programs were often pursued as supplemental sources of funding, as well as energy savings performance contract initiatives. Other activities include energy awareness programs featuring energy awareness seminars, the identification of no-cost or low-cost measures, the designation of building energy monitors, publication of materials promoting energy efficiency, the procurement of energy-efficient goods and products, increased maintenance training, and increased engineering assistance.

A number of agencies began submitting energy data to DOE starting in FY 1989 in compliance with NECPA as amended by the Federal Energy Management Improvement Act of 1988 (Pub. L. 100-615). Among these agencies are the Department of State, the Office of Personnel Management, and the Federal Energy Regulatory Commission. These three agencies submitted historical energy data back to FY 1985.

For FY 1990 and forward, Federal Energy Regulatory Commission energy consumption is reported as part of DOE and is therefore grouped under the category of "Other" for the years prior to FY 1990. Other agencies grouped under the category of "Other" in the tables had no

buildings data to report for FY 1985. These agencies include the Federal Trade Commission, the National Archives and Records Administration, the Nuclear Regulatory Commission, the Railroad Retirement Board, Social Security Administration, and the U.S. Information Agency. The National Science Foundation, Federal Emergency Management Agency, and Office of Personnel Management also are grouped under this category due to lack of reporting in more recent years.

In FY 2000, GSA continued to delegate building management authority to agencies that occupy buildings owned and operated by GSA. As a result, several agencies reported increased gross square footage and energy consumption relative to FY 1985, while GSA reported decreases in these categories during the same period. The GSA delegation accounts for the significant inter-year changes in energy consumption reported by various individual agencies. Two agencies, the Department of Health and Human Services and the Department of Commerce, adjusted their baseline year consumption and GSF figures during FY 1988 to reflect GSA delegations. DOC added the Jeffersonville Federal Center to its data reports, which greatly increased its gross square footage. In addition, three Commerce Bureaus, the Bureau of Economic Affairs, the National Technical Information Service, and the Patent and Trademark Office, all became eligible for reporting in FY 1989 as a result of leasing delegation.

## III. INDUSTRIAL, LABORATORY, AND OTHER ENERGY INTENSIVE FACILITIES

### A. Energy Consumption and Costs for Energy Intensive Facilities

NECPA, as amended, 42 U.S.C. § 8253, allows agencies to exclude from the buildings goal, facilities which house energy intensive activities. The energy consumed in these facilities is reported under the category of "industrial, laboratory, and other energy intensive facilities."

The designation of these facilities is at the discretion of each agency. Currently, 16 agencies are excluding specific facilities from the NECPA goal and reporting them as energy intensive facilities under Executive Order 13123: the Departments of Agriculture, Commerce, Defense, Energy, Health and Human Services, Justice, State, and the Treasury, the Environmental Protection Agency, Federal Communications Commission, GSA, the National Aeronautics and Space Administration, the National Archives and Records Administration, the Social Security Administration, the Tennessee Valley Authority, and the U.S. Information Agency (now known as the International Broadcasting Bureau. Lists of the energy intensive facilities that have been identified by the agencies are included in Appendix D.

Table 9 shows that energy consumed in industrial, laboratory, and other energy intensive facilities have decreased 10.9 percent compared to FY 1990 and increased 8.0 percent from FY 1999. During FY 2000, the Department of Defense consumed 32.3 trillion Btu of this category's energy, 48.2 percent of all energy used by the Federal Government in energy intensive facilities.

Some of the fluctuations in energy consumption in energy intensive facilities resulted from agencies changing data collection and reporting procedures. The Social Security Administration began reporting its energy separately from the Department of Health and Human Services in FY 1996 and has elected to designate check processing facilities as energy intensive. The Department of Justice commenced reporting energy consumption in its energy intensive facilities during FY 1994, but has not backed out the consumption for these facilities from the standard buildings category for previous years. NASA began reporting energy under this category in FY 1989 and has revised its prior year data to reflect the removal of its energy intensive facilities from the standard building category. GSA began reporting energy in excluded buildings in FY 1990 and has backed out this energy consumption from its FY 1985 standard buildings data. The Departments of Agriculture and Commerce both began excluding buildings where energy intensive activities occur in FY 1992. USDA revised all of its prior year buildings data back to FY 1985 to reflect the exclusion of the Agricultural Research Service. The Commerce Department revised its standard buildings data for FY 1985 and FY 1999 only to reflect the exclusion of its energy intensive facilities. The State Department and NARA began reporting energy in energy intensive facilities separately in FY 1993 and have not revised data for any prior years.

TABLE 9

FEDERAL SITE-DELIVERED ENERGY CONSUMPTION IN ENERGY-INTENSIVE FACILITIES

(In Billions of Btu, with Conversions to Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x $10^{15}$])

| CIVILIAN AGENCY | **FY 1990** | FY 1991 | FY 1992 | FY 1993 | FY 1994 | FY 1995 | FY 1996 | FY 1997 | FY 1998 | **FY 1999** | **FY 2000** | %CHANGE 90-00 | %CHANGE 99-00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DOE | **11,795.6** | 11,541.3 | 12,657.8 | 10,900.5 | 11,000.3 | 17,236.2 | 16,876.6 | 8,209.1 | 6,367.8 | **7,188.9** | **7,650.0** | -35.1 | 6.4 |
| HHS | **6,695.6** | 5,998.0 | 6,578.2 | 6,824.1 | 7,170.6 | 5,822.6 | 6,405.6 | 7,217.7 | 6,764.3 | **6,498.6** | **7,138.8** | 6.6 | 9.8 |
| GSA [1] | **4,354.0** | 746.2 | 677.6 | 994.6 | 1,060.2 | 1,213.8 | 961.0 | 890.7 | 849.2 | **1,150.8** | **5,093.8** | 17.0 | 342.6 |
| NASA | **4,142.9** | 3,910.8 | 4,012.9 | 3,816.2 | 4,070.7 | 3,900.6 | 3,535.9 | 3,835.6 | 3,897.9 | **3,794.5** | **3,584.6** | -13.5 | -5.5 |
| USDA | **2,204.2** | 2,133.3 | 1,966.3 | 2,166.9 | 2,119.3 | 2,824.0 | 2,140.8 | 2,221.6 | 2,416.5 | **2,589.0** | **2,368.5** | 7.5 | -8.5 |
| TRSY | **1,707.2** | 1,026.8 | 814.1 | 923.7 | 771.8 | 941.0 | 928.3 | 1,131.8 | 996.5 | **964.2** | **2,303.7** | 34.9 | 138.9 |
| TVA | **1,701.0** | 1,661.9 | 1,546.5 | 1,354.1 | 1,390.6 | 1,317.1 | 1,235.6 | 1,251.8 | 1,208.4 | **1,436.1** | **1,453.8** | -14.5 | 1.2 |
| DOC | **976.6** | 0.0 | 976.6 | 770.8 | 1,110.2 | 1,627.4 | 1,823.0 | 1,335.2 | 1,332.0 | **1,400.4** | **1,315.8** | 34.7 | -6.0 |
| USIA/IBB | **1,406.9** | 850.6 | 828.5 | 796.8 | 861.1 | 878.2 | 936.2 | 1,092.2 | 1,020.4 | **951.4** | **951.4** | -32.4 | 0.0 |
| EPA | **747.0** | 822.4 | 839.7 | 894.1 | 943.3 | 1,020.9 | 1,023.5 | 1,012.1 | 1,022.7 | **1,170.2** | **940.3** | 25.9 | -19.6 |
| DOJ | **0.0** | 0.0 | 0.0 | 0.0 | 668.4 | 707.8 | 944.1 | 846.9 | 850.7 | **862.8** | **862.2** | N/A | -0.1 |
| NARA | **81.9** | 82.2 | 88.8 | 274.7 | 610.7 | 792.2 | 562.9 | 572.7 | 591.8 | **582.1** | **544.6** | 565.3 | -6.5 |
| ST | **0.0** | 0.0 | 0.0 | 337.4 | 339.4 | 344.4 | 364.1 | 339.1 | 324.2 | **315.5** | **273.3** | N/A | -13.4 |
| SSA | **0.0** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 215.5 | 204.7 | 211.4 | **199.1** | **237.5** | N/A | 19.3 |
| FCC | **0.0** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | **0.0** | **6.3** | N/A | N/A |
| PCC | **190.8** | 197.1 | 193.9 | 197.5 | 201.3 | 209.4 | 218.6 | 221.2 | 0.0 | **0.0** | **0.0** | -100.0 | N/A |
| CIVILIAN AGENCIES TOTAL | **36,003.5** | 28,970.5 | 31,180.9 | 30,251.3 | 32,317.7 | 38,835.4 | 38,171.9 | 30,382.2 | 27,853.9 | **29,103.8** | **34,724.2** | -3.6 | 19.3 |
| DOD | **39,209.1** | 56,372.1 | 67,913.1 | 41,159.3 | 39,781.4 | 37,962.6 | 37,260.1 | 35,702.3 | 36,588.4 | **32,919.0** | **32,280.9** | -17.7 | -1.9 |
| ALL AGENCIES | **75,212.6** | 85,342.6 | 99,094.0 | 71,410.7 | 72,099.1 | 76,798.0 | 75,431.9 | 66,084.5 | 64,442.3 | **62,022.8** | **67,005.2** | -10.9 | 8.0 |
| MBOE | **12.9** | 14.7 | 17.0 | 12.3 | 12.4 | 13.2 | 12.9 | 11.3 | 11.1 | **10.6** | **11.5** | | |
| Petajoules | **79.3** | 90.0 | 104.5 | 75.3 | 76.1 | 81.0 | 79.6 | 69.7 | 68.0 | **65.4** | **70.7** | | |

DATA AS OF 11/30/01

Note: This table uses a conversion factor for electricity of 3,412 Btu per kilowatt hour. Sum of components may not equal total due to independent rounding.

[1] GSA's large increase in energy reported under this category for FY 2000 compared to FY 1999 is a result of the agency reclassifying buildings from the standard buildings inventory for FY 1990 and FY 2000 without adjusting data for the intervening years.

Source: Federal Agency Annual Energy Management Data Reports

Energy used in energy intensive facilities accounts for approximately 6.8 percent of the total 0.98 quads used by the Federal Government. Electricity constitutes 48.4 percent of the energy used in energy intensive facilities, 32.4 percent is accounted for by natural gas, 5.3 percent by coal, and 9.9 percent by fuel oil. Small amounts of purchased steam, liquefied petroleum gas (LPG)/propane, and "other" energy account for the remaining 3.9 percent.

The energy used in energy intensive operations in FY 2000 accounted for approximately 8.3 percent of the total Federal energy bill. Table 10 shows that the Federal Government spent approximately $611.2 million for this category's energy during the fiscal year. The combined cost of energy intensive facility energy in FY 2000 was $9.12 per million Btu, up 2.8 percent from the combined cost of $8.88 reported in FY 1999 (see Appendix C).

TABLE 10
DEFENSE AND CIVILIAN FEDERAL COSTS FOR ENERGY INTENSIVE FACILITIES ENERGY IN FY 2000
(In Millions of Dollars)

| | ELECTRICITY | FUEL OIL | NATURAL GAS | LPG/ PROPANE | COAL | PURCHASED STEAM | OTHER | TOTAL |
|---|---|---|---|---|---|---|---|---|
| DEFENSE | 185.597 | 16.068 | 34.096 | 0.631 | 6.101 | 4.549 | 0.187 | 247.228 |
| CIVILIAN | 285.800 | 12.377 | 49.815 | 1.065 | 0.109 | 13.825 | 0.970 | 363.962 |
| TOTAL | 471.397 | 28.445 | 83.911 | 1.696 | 6.210 | 18.374 | 1.157 | 611.190 |

AVERAGE COST PER UNIT, BASED ON REPORTS FROM AGENCIES

| | | | |
|---|---|---|---|
| ELECTRICITY | = | 49.59 | / MWH |
| FUEL OIL | = | 0.59 | / GALLON |
| NATURAL GAS | = | 3.98 | / THOUSAND CUBIC FEET |
| LPG/PROPANE | = | 0.67 | / GALLON |
| COAL | = | 42.59 | / SHORT TON |
| PURCHASED STEAM | = | 8.25 | / MILLION BTU |
| OTHER | = | 9.65 | / MILLION BTU |

DATA AS OF 11/30/01

Note: Sum of components may not equal total due to independent rounding.

Source: Annual energy cost data submitted to DOE by Federal agencies.

## B. Statutory Background and Progress Toward Goals for Energy Intensive Facilities

Under section 543(a)(2) of NECPA, as amended by EPACT, 42 U.S.C. § 8253, buildings that house energy-intensive activities may be excluded from NECPA's performance goal for buildings. These buildings are listed in Appendix D. Most energy used in excluded buildings is process energy. Process energy is consumed in industrial operations, laboratories certain R&D activities, and in electronic-intensive facilities.

Executive Order 12902 expanded the scope of Federal energy management activities beyond the NECPA mandates by establishing goals for industrial operations. It required industrial facilities to increase in energy efficiency by at least 20 percent by 2005 as compared to 1990. Section 203 of Executive Order 13123 further expands this goal by requiring each agency to reduce energy consumption per square foot, per unit of production, or per other unit as applicable by 20 percent by 2005 and 25 percent by 2010 relative to 1990. This goal covers laboratory and other energy-intensive facilities in addition to industrial facilities. Measures undertaken to achieve this goal must be life-cycle cost-effective, and agencies are also directed to implement all cost-effective water conservation projects.

During FY 1999, the Energy Intensive Facilities Working Group worked to produce a guidance document entitled *Guidelines: Executive Order 13123, Section 203 Performance Goals for Industrial, Laboratory, Research, and Other Energy-Intensive Facilities*. The document was reviewed and approved by the Interagency Energy Management Task Force and issued in January 2000. The guidelines fulfill two requirements under the Executive Order. These are that the Secretary of Energy shall:

- Issue guidelines to assist agencies in measuring energy per square foot, per unit of production, or other applicable unit in industrial, laboratory, research, and other energy-intensive facilities (Section 502(a)); and

- Develop guidance to assist agencies in calculating appropriate energy baselines for previously exempt facilities and facilities occupied after 1990 in order to measure progress toward goals (Section 502(c)).

The guidance presents three options for measuring performance. These are: a rate-based measure of annual energy consumed per number of production units; a rate-based measure of annual energy consumed per number of other applicable units (for example, number of experiments, labor hours, customers served); and Btu per gross square foot. The guidance provides advise on which measurement option is appropriate, depending on agency-specific factors. The guidance also advises agencies on the proper manner of calculating appropriate energy baselines for previously exempt buildings and facilities. The Executive Order contains strict criteria for exemption that will mean agencies having to re-examine previously exempt buildings and possibly reassign them to one of the goal categories.

More detail on each agency's approach to tracking and achieving progress toward the energy intensive facility goals are contained in the individual agency's narratives in Section VI.

The Department of Defense reports facilities that perform production or industrial functions under the energy intensive facilities category. Because the relationship between energy consumption and production varies widely between processes, DOD has decided to use energy usage per gross square foot as the performance measure for the industrial and laboratory facility category. Additionally, to simplify data collection, and the associated metering and reporting costs, DOD considers an entire base an industrial facility if 60 percent or more of the base-wide energy use is for industrial purposes. DOD established a FY 1990 baseline of 213,349 Btu/GSF for the energy intensive facilities category. During FY 2000, DOD achieved a 22.7 percent reduction in Btu/GSF consumption relative to the FY 1990 base year.

DOE reports its use of metered energy in extensive experimental research and production processes under the energy intensive facility category. This energy is consumed in: production nuclear reactors, industrial-type operations for weapons and nuclear fuel production, and research and development facilities such as experimental nuclear reactors and linear accelerators. Metered process energy totaled almost 7.7 trillion Btu in FY 2000, which represents 27.1 percent of all facility energy consumed by DOE. The use of metered process energy by DOE in FY 2000 was 35.1 percent less than in FY 1990, and 6.4 percent more than FY 1999. The primary contributor to the substantial drop beginning in FY 1997 was the sale by DOE of the Naval Petroleum Reserve, California, and subsequent decreases in natural gas consumption. DOE anticipates exempting appropriate facilities from the requirements of Executive Order 13123 during the FY 2001 reporting period and updating its reporting system to accommodate this change. Most of the facilities proposed for exemption are currently reported under the metered process category and have been scaled back operationally to prepare for decontamination and decommissioning. As part of the reporting change for FY 2001, some laboratory buildings currently being reported under the standard buildings category may also be reclassified under the energy intensive facility category.

Eighty-nine percent of the Department of Health and Human Service's square footage is energy intensive facilities including laboratories, hospitals, animal centers, health clinics, and other related support space. The performance measure used for the HHS energy intensive facilities is Btu/GSF. In FY 2000, the energy consumption of HHS energy intensive facilities declined 10.4 percent compared to FY 1990.

At USDA, Agricultural Research Service (ARS) facilities energy performance is measured based on Air-Quality-Adjusted Btu/GSF, which removes the impact of present day requirements for increased laboratory ventilation air for safety and health reasons. Since 1990, ARS has undertaken an extensive conversion program of systematically modifying space-conditioning systems in its laboratory facilities to use far less re-circulating air, and more fresh air from outside the building, in order to protect ARS and university researchers from the health and safety risks of hazardous chemicals and airborne pathogens. These requirements have become more stringent and require greater energy use than the standards that were in place in 1990, the base year of the goal. Removing the effect of the modernization-related increase results in a reduction of approximately 23 percent from the baseline consumption in FY 1990 based on Air-Quality Adjusted Btu/GSF.

The Justice Department's energy intensive facilities are comprised of large data centers, FBI labs, the FBI headquarters facility, and the training facility in Quantico, Virginia. These facilities operate 24 hours per day, 365 days per year and are not typical office buildings. DOJ did not report developing a baseline for FY 1990 or designate a performance indicator for these facilities.

Treasury reports energy consumption for 3.3 million square feet of industrial space. The Bureau of Engraving and Printing and the U.S. Mint occupied the majority of the space. As of FY 2000, Treasury's industrial facilities have achieved a 2.9 percent reduction in consumption over their FY 1990 baseline on a Btu/GSF basis.

Since 1985, the EPA has measured and reported laboratory energy and water consumption using its standard facility 1985 baseline and reduction requirements. Starting in FY 2000 EPA is no longer reporting its laboratory energy and water consumption under the standard facility designation and is now using the more appropriate energy intensive facility designation. EPA reduced energy consumption in Agency-owned laboratories from 399,907 Btu/GSF. in 1985 to 348,401 Btu/GSF in FY 2000—a reduction of 12.9 percent. Energy use fell from 357,348 Btu/GSF in 1990 to 348,401 Btu/GSF in FY 2000—a decrease of only 2.5 percent—because the Agency built seven additional facilities during those years. EPA received credit for purchases of 7.6 billion Btu of renewable electricity. This lowered the energy intensity of its laboratories from 351,251 Btu/GSF to 348,401 Btu/GSF.

GSA's energy usage in its energy intensive facilities during FY 2000 was 287,476 Btu/GSF compared to 432,313 Btu/GSF in FY 1990. This represents a decrease of 33.5 percent compared with the 1990 base year. In 2000, GSA invested $495,744 of energy program appropriations in its industrial and laboratory facilities.

NASA has elected to use Btu/GSF as the agency-wide aggregate performance measure for energy intensive facilities. Other performance measures are utilized for individual industrial facilities, space flight tracking stations, and clean rooms. The average energy intensity for NASA's energy intensive buildings was 256,613 Btu/GSF by the end of FY 2000, as compared to the FY 1990 baseline value of 323,955 Btu/GSF. This represents a decrease of 20.8 percent.

The Department of Commerce's energy intensive buildings are operated by three of its agencies: the National Institute of Standards and Technology (NIST), the National Oceanic and Atmospheric Administration (NOAA), and the Bureau of the Census. NIST installations are comprised of general purpose and special laboratories that require constant environmental space control and base electrical loads for scientific equipment and computer systems. NOAA Weather Service facilities operate 24 hours a day and consist of radar towers, computers, special gauges, meters and other sophisticated equipment. Marine Fisheries and Laboratories conduct marine biology research and utilize refrigerators, freezers, incubators, coolers, seawater pumps, and compressors that operate 24 hours a day. The Bureau of Census Charlotte Computer Center is a leased facility and is used solely as a computer center. The building is operated 24 hours a day.

The International Broadcasting Bureau (formerly the U.S. Information Agency) designates domestic and overseas Voice of America Relay Stations as energy-intensive facilities.

The State Department includes in this category unique, special-use facilities with special security and operational requirements including the President's guest house, a computer facility, the International Chancery Center, and the Harry S. Truman Headquarters Building.

NARA designates all 12 of its facilities as energy intensive because of stringent records storage requirements which demand that documents and records be maintained in a controlled environment 24 hours per day, 365 days per year.

The Social Security Administration, which began reporting energy consumption this year as an independent agency, has designated its National Computer Center as an energy intensive facility. The Center contains SSA's main database and operates 24 hours per day and 365 days per year.

## IV. EXEMPT FACILITIES

### A. Energy Consumption and Costs for Exempt Facilities

Sec. 704 of the Order defines "Exempt facility" as "a facility. . .for which an agency uses DOE-established criteria to determine that compliance with the Energy Policy Act of 1992 or [Executive Order 13123] is not practical." Section 502(b) of Executive Order 13123 requires the Secretary of Energy, in collaboration with other agency heads, to "establish criteria for determining which facilities are exempt from the Order. In addition, DOE must provide guidance for agencies to report proposed exemptions." This guidance was issued in December 1999. The following facilities may be exempted from Section 201, Greenhouse Gas Reduction Goal, Section 202, Energy Efficiency Improvement Goals for standard buildings and facilities, and the goals of Section 203, Industrial and Laboratory Facilities of Executive Order 13123:

- Structures such as outside parking garages which consume essentially only lighting energy, yet are classed as buildings.

- Buildings where energy usage is skewed significantly due to reasons such as: buildings entering or leaving the inventory during the year, buildings down-scaled operationally to prepare for decontamination, decommissioning and disposal, and buildings undergoing major renovation and/or major asbestos removal.

- Federal ships that consume "Cold Iron Energy," (energy used to supply power and heat to ships docked in port) and airplanes or other vehicles that are supplied with utility-provided energy.

- Buildings and facilities in which it is technically infeasible to implement energy efficiency measures or where conventional performance measures are rendered meaningless by an overwhelming proportion of process-dedicated energy. For these exemptions, a finding of impracticability must be approved by the DOE as outlined in Section 543(c) of the National Energy Conservation Policy Act, as amended by the Energy Policy Act of 1992. For buildings where exemptions are granted, agencies should undertake energy audits and are strongly encouraged to implement all life-cycle cost-effective measures per the recommendation of the audit.

Five agencies, the Departments of Defense, Health and Human Services, and Transportation, the National Aeronautics and Space Administration, and the GSA have chosen to exempt facilities from Executive Order requirements. These facilities are listed in Appendix E. The U.S. Postal Service has reported electricity consumption used in mail processing automation under the exempt category without reporting associated facility square footage. Table 11 presents an accounting of energy use and costs in exempt facilities for FY 2000 and shows what percentage of each agency's facility energy use, costs, and space is considered exempt.

TABLE 11
ENERGY CONSUMPTION, COSTS, AND GROSS SQUARE FOOTAGE OF FEDERAL EXEMPT FACILITIES, FY 2000

| | Energy Consumption | | Energy Costs | | Facility Gross Square Feet | |
|---|---|---|---|---|---|---|
| Agency | (BBtu) | % of Agency's Total Facility Use | ($ Million) | % of Agency's Total Facility Costs | (Thou. Sq. Ft.) | % of Agency's Total Facility Space |
| DOD | 9,575.1 | 3.8% | $124.102 | 5.2% | 0.0 | N/A |
| DOT | 6,443.4 | 64.1% | $64.260 | 53.6% | 16,533.2 | 31.4% |
| USPS | 2,069.6 | 7.6% | $45.607 | 11.0% | 0.0 | N/A |
| NASA | 1,781.5 | 18.5% | $18.732 | 18.0% | 4,962.2 | 12.4% |
| GSA | 683.5 | 3.9% | $11.112 | 4.4% | 10,964.8 | 5.4% |
| HHS | 8.3 | 0.1% | $0.143 | 0.2% | 882.8 | 3.5% |
| Total | 20,561.4 | | $263.956 | | 33,343.0 | |

DATA AS OF 11/30/01

TABLE 12
CONSUMPTION AND COSTS OF FEDERAL EXEMPT FACILITY ENERGY BY FUEL TYPE IN FY 2000

| ENERGY TYPE | BILLIONS OF BTU | COST PER MMBTU | COST (IN MILLIONS OF DOLLARS) |
|---|---|---|---|
| ELECTRICITY | 15,387.1 | 15.1430 | 233.007 |
| FUEL OIL | 2,808.4 | 4.4038 | 12.368 |
| NATURAL GAS | 985.0 | 5.4490 | 5.367 |
| LPG/PROPANE | 47.4 | 12.8396 | 0.608 |
| COAL | 0.0 | 0.0000 | 0.000 |
| PURCHASED STEAM | 572.3 | 7.1518 | 4.093 |
| OTHER | 761.2 | 11.1838 | 8.513 |
| TOTAL | 20,561.4 | | 263.956 |

AVERAGE COST PER MMBTU = $12.8375

DATA AS OF 11/30/01

This table uses a conversion factor for electricity of 3,412 Btu per kilowatt hour. Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

Table 12 illustrates total exempt energy consumption and costs by fuel type for FY 2000. Energy used in exempt facilities accounts for approximately 2.1 percent of the total 0.98 quads used by the Federal Government. Electricity constitutes 74.8 percent of the energy used in exempt facilities, 4.8 percent is accounted for by natural gas, and 13.7 percent by fuel oil. Small amounts of purchased steam, liquefied petroleum gas (LPG)/propane, and "other" energy account for the remaining 6.7 percent.

The energy used in exempt facilities in FY 2000 accounted for approximately 3.6 percent of the total Federal energy bill. The Federal Government spent approximately $264.0 million for this

category's energy during the fiscal year. The combined cost of energy intensive facility energy in FY 2000 was $12.84 per million Btu.

Under DOD, the Navy is the only Military Service to list facilities classified as exempt. The Navy exempts mission-critical, concentrated energy use transmitters, simulators, cold iron support to ships, and some privately-owned facilities. These are non-production-oriented facilities with little or no square footage, making conventional performance measures meaningless. (DOD did not report any square footage for this category.) The mission criticality of these end users is such that energy efficiency measures are evaluated on a case-by-case basis.

Within the Department of Transportation, the Federal Aviation Administration excludes all buildings involved in implementing the National Airspace System Plan. These buildings house energy-intensive electronic equipment with the associated HVAC requirements to maintain an environment for reliable equipment operation.

GSA exempts those buildings and facilities where energy usage is skewed significantly due to reasons such as: buildings entering or leaving the inventory during the year; buildings down-scaled operationally to prepare for disposal; buildings undergoing major renovation and/or major asbestos removal; or buildings functions like that of outside parking garages which consume essentially only lighting energy, yet are classed as buildings.

NASA exempts 5.0 million square feet of its mission-variable (MV) facilities or 12.4 percent of its total facility space. These facilities are highly specialized and energy intensive, having been constructed for specific space flight and research programs. Examples are wind tunnels driven by multi-thousand horsepower electric motors, space simulation chambers, and space communication facilities. Energy consumption in these facilities varies directly with the level and intensity of program activities. NASA provided justifications for each MV facility exemption to explain why it is either technically infeasible to implement energy efficiency measures or to apply conventional performance measures due to the overwhelming proportion of process-dedicated energy consumed in these facilities.

The only exempted facilities at HHS are outdoor multilevel parking garages on the NIH Bethesda Campus that consume lighting energy only. These facilities are not metered separately. Therefore, the energy consumption of these structures has been estimated based on the number of lighting fixtures and the time of use.

The Postal Service energy consumption reported under this category reflects process energy consumed by mail processing equipment. This consumption has been factored out of energy consumption of Postal Service standard buildings in order to provide a better measure of their energy efficiency status.

# V. ENERGY MANAGEMENT IN VEHICLES AND EQUIPMENT

## A. Energy Consumption and Costs for Vehicles and Equipment

Vehicle and equipment energy consists of energy used by equipment ranging in size and function from aircraft carriers to forklifts. It includes aircraft and naval fuels, automotive fuels consumed by Federally-owned and leased vehicles and privately-owned vehicles used for official business, and the energy used in Federal construction.

Table 13 shows that in FY 2000, the Federal Government used approximately 566.1 trillion Btu of energy for vehicles and equipment, a decrease of 39.4 percent relative to FY 1985. DOD's vehicle and equipment energy consumption decreased 41.4 percent from FY 1985, while the civilian agencies increased consumption by 1.8 percent. Overall, vehicle and equipment consumption decreased 6.8 percent from FY 1999. Federal energy consumption in vehicles and equipment is at its lowest level since Federal agencies began reporting consumption in 1975. This is mainly attributable to decreased operations by the Department of Defense.

Jet fuel consumption accounted for 71.2 percent of all vehicle and equipment energy in FY 2000. In FY 2000 compared to the previous year, jet fuel consumption decreased 9.4 percent from 444.7 trillion Btu to 403.0 trillion Btu.

Agencies have taken many tangible steps to keep the use of vehicle fuels to a minimum. For example, USPS continues to modernize its fleet, adding diesel delivery vans and long-life vehicles to its inventory, both of which are more fuel efficient than the older vehicles they replaced. DOD continues to increase the use of flight simulators, as well as the use of new propulsion technologies in order to lessen the growth of vehicle and equipment fuel consumption.

Figure 10 depicts the vehicles and equipment fuel mix within DOD and civilian agencies. Jet fuel accounted for 403.0 trillion Btu or 71.2 percent of the total energy usage in the category, with 21.6 percent attributed to diesel and distillate fuel, 5.6 percent to auto gasoline, and 1.6 percent to aviation gasoline, navy special, LPG/propane and other fuels, combined.

TABLE 13
FEDERAL ENERGY CONSUMPTION IN VEHICLE AND EQUIPMENT OPERATIONS
(In Billions of Btu, with Conversions to Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x $10^{15}$])

| CIVILIAN AGENCY | **FY 1985** | FY 1990 | FY 1991 | FY 1992 | FY 1993 | FY 1994 | FY 1995 | FY 1996 | FY 1997 | FY 1998 | **FY 1999** | **FY 2000** | %Change 85-00 | %Change 99-00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| USPS | **11,524.2** | 12,136.2 | 12,196.2 | 12,225.0 | 12,565.3 | 13,348.6 | 14,571.2 | 14,217.1 | 16,779.2 | 14,777.2 | **14,583.7** | **14,987.2** | 30.1 | 2.8 |
| DOT | **11,957.0** | 12,150.8 | 12,350.7 | 8,702.6 | 10,769.7 | 12,917.0 | 12,193.7 | 12,222.9 | 12,347.9 | 10,145.0 | **10,870.5** | **10,327.9** | -13.6 | -5.0 |
| DOJ | **2,064.0** | 2,097.9 | 2,124.0 | 3,675.1 | 2,835.9 | 3,451.3 | 3,181.6 | 3,693.0 | 3,149.3 | 7,171.4 | **6,456.3** | **7,481.7** | 262.5 | 15.9 |
| USDA | **4,319.6** | 4,952.3 | 5,123.8 | 4,982.7 | 4,931.2 | 5,129.1 | 4,821.7 | 4,654.8 | 3,153.0 | 3,389.4 | **3,337.9** | **3,025.7** | -30.0 | -9.4 |
| DOI | **3,053.9** | 3,352.5 | 3,208.6 | 3,819.1 | 3,507.8 | 3,970.0 | 2,782.2 | 1,347.5 | 2,943.7 | 2,679.9 | **3,661.4** | **1,963.5** | -35.7 | -46.4 |
| TRSY | **2,155.0** | 1,473.2 | 1,655.7 | 2,065.2 | 2,420.9 | 2,161.8 | 1,773.4 | 1,350.9 | 1,561.4 | 2,078.6 | **2,120.2** | **1,947.0** | -9.7 | -8.2 |
| NASA | **1,972.7** | 1,736.7 | 1,864.0 | 1,875.4 | 1,798.0 | 1,734.3 | 1,750.9 | 1,539.3 | 1,622.1 | 1,428.3 | **1,412.8** | **1,306.7** | -33.8 | -7.5 |
| DOE | **2,882.0** | 2,520.4 | 2,559.7 | 2,078.1 | 2,241.3 | 2,085.9 | 1,841.9 | 1,561.0 | 1,971.0 | 1,955.6 | **1,444.6** | **1,222.1** | -57.6 | -15.4 |
| VA | **592.8** | 518.3 | 317.4 | 634.9 | 663.9 | 374.4 | 353.6 | 660.7 | 1,199.1 | 1,380.3 | **1,337.6** | **874.4** | 47.5 | -34.6 |
| TVA | **578.5** | 476.6 | 534.7 | 408.8 | 452.4 | 480.3 | 541.7 | 583.8 | 479.5 | 429.1 | **423.3** | **821.9** | 42.1 | 94.2 |
| GSA | **144.1** | 128.1 | 122.6 | 102.9 | 79.6 | 69.9 | 91.3 | 98.8 | 119.9 | 122.2 | **125.2** | **162.6** | 12.8 | 29.9 |
| HHS | **373.3** | 0.0 | 0.0 | 0.0 | 177.3 | 176.3 | 105.5 | 18.6 | 435.0 | 447.7 | **447.7** | **84.4** | -77.4 | -81.1 |
| EPA | **132.3** | 0.0 | 0.0 | 0.0 | 100.7 | 98.0 | 99.6 | 76.5 | 137.2 | 97.7 | **120.6** | **42.2** | -68.1 | -65.0 |
| ST | **14.8** | 34.9 | 0.0 | 0.0 | 7.5 | 0.0 | 0.0 | 0.0 | 44.7 | 40.9 | **40.9** | **41.5** | 181.0 | 1.5 |
| DOL | **232.2** | 239.0 | 401.9 | 388.7 | 369.1 | 369.6 | 356.9 | 337.7 | 336.2 | 350.2 | **350.2** | **13.8** | -94.0 | -96.0 |
| FCC | **12.4** | 9.1 | 7.2 | 7.5 | 7.2 | 6.6 | 6.6 | 4.8 | 7.1 | 6.6 | **6.6** | **11.6** | -6.9 | 74.8 |
| DOC | **1,010.2** | 3,100.3 | 1,315.2 | 952.5 | 995.7 | 995.2 | 760.6 | 570.1 | 929.1 | 708.4 | **834.5** | **4.5** | -99.6 | -99.5 |
| HUD | **0.0** | 0.0 | 32.7 | 33.6 | 31.6 | 30.7 | 25.4 | 25.4 | 28.3 | 23.3 | **23.3** | **0.2** | N/A | -99.1 |
| PCC | **530.4** | 653.7 | 578.6 | 699.6 | 684.9 | 688.4 | 866.7 | 829.7 | 766.8 | 0.0 | **0.0** | **0.0** | -100.0 | N/A |
| OTHER* | **39.2** | 69.6 | 27.6 | 113.6 | 106.7 | 105.4 | 119.6 | 116.9 | 140.1 | 147.6 | **144.0** | **36.1** | -7.9 | -74.9 |
| CIVILIAN AGENCIES TOTAL | **43,588.5** | 45,649.7 | 44,420.7 | 42,765.2 | 44,746.7 | 48,193.0 | 46,244.1 | 43,909.5 | 48,150.6 | 47,379.4 | **47,741.4** | **44,355.2** | 1.8 | -7.1 |
| DOD | **890,679.9** | 881,345.1 | 926,033.6 | 740,357.2 | 727,887.1 | 674,597.5 | 640,893.4 | 631,202.0 | 617,235.4 | 579,959.8 | **559,785.8** | **521,725.7** | -41.4 | -6.8 |
| ALL AGENCIES | **934,268.4** | 926,994.8 | 970,454.3 | 783,122.4 | 772,633.8 | 722,790.5 | 687,137.4 | 675,111.5 | 665,386.0 | 627,339.2 | **607,527.2** | **566,080.9** | -39.4 | -6.8 |
| MBOE | **160.4** | 159.1 | 166.6 | 134.4 | 132.6 | 124.1 | 118.0 | 115.9 | 114.2 | 107.7 | **104.3** | **97.2** | | |
| Petajoules | **985.6** | 977.9 | 1,023.8 | 826.2 | 815.1 | 762.5 | 724.9 | 712.2 | 702.0 | 661.8 | **640.9** | **597.2** | | |

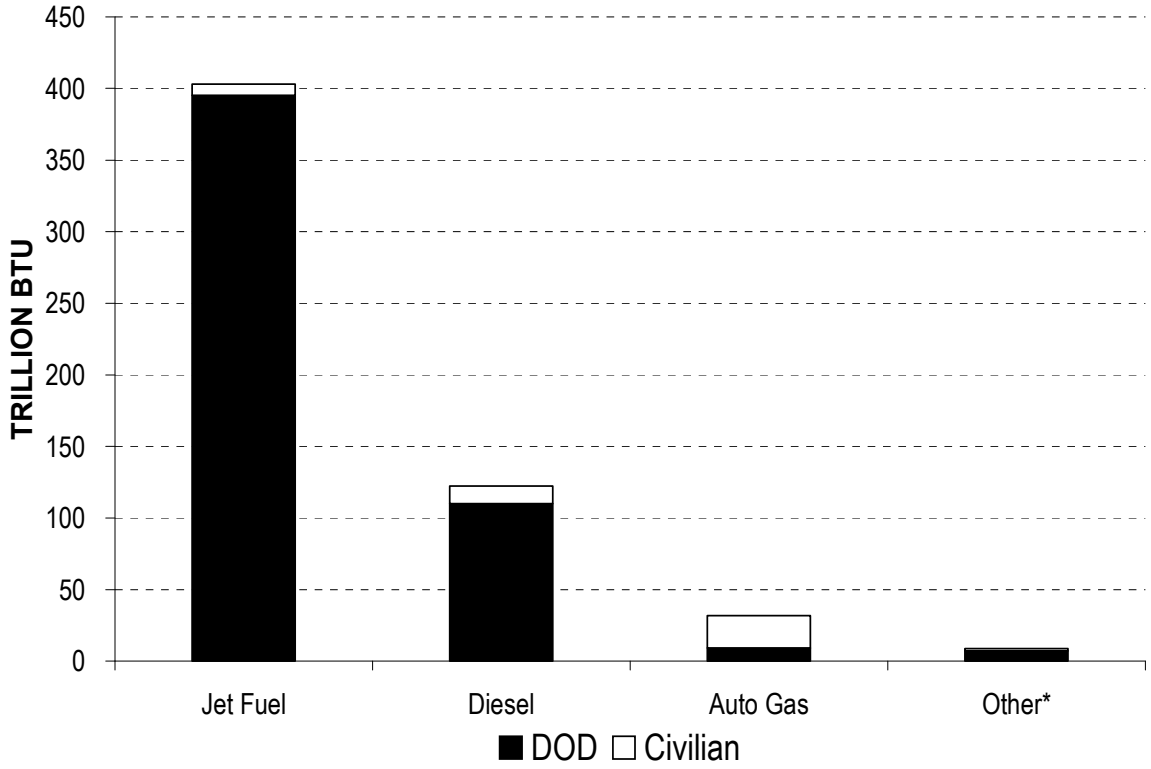
DATA AS OF 11/30/01

*Other includes for certain years the CFTC, CIA, FEMA, NSF, NRC, OPM, and USIA/IBB.

Note: FY 1999 data was used to estimate the non-tactical vehicle component of agency energy consumption for FY 2000.
Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

**FIGURE 10**
**Defense and Civilian Consumption in**
**Vehicles and Equipment by Fuel Type, FY 2000**




*Other includes navy special, aviation gas,and LPG/propane

As shown in Tables 14-A and 14-B, the Federal Government spent $3,099.7 million on vehicles and equipment energy in FY 2000, 22.3 percent less than the FY 1999 expenditure of $3,987.9 million constant dollars. In FY 2000, the combined price for all types of vehicles and equipment energy was $5.48 per million Btu, down 16.6 percent from FY 1999. The average real cost of gasoline to the Federal Government decreased from $1.13 per gallon in FY 1999 to $1.03 in FY 2000. The unit cost for diesel/distillate fuel declined 22.5 percent while the unit cost for jet fuel fell 14.8 percent.

When compared to FY 1985 using constant 2000 dollars, energy costs for vehicles and equipment decreased 64.8 percent from $8,800.4 million to $3,099.7 million in FY 2000. During that same period, the Government's combined cost per million Btu for vehicles and equipment energy fell 41.8 percent from $9.42 to $5.48 in constant dollars.

Vehicle and equipment fuel costs in FY 2000 represent 42.1 percent of the Government's total energy costs of $7.3 billion.

# TABLE 14-A
# DEFENSE AND CIVILIAN FEDERAL COSTS FOR VEHICLE AND EQUIPMENT ENERGY IN FY 2000
## (In Millions of Dollars)

| | AUTO GAS | DIST. DIESEL | LPG/ PROPANE | AVIATION GAS | JET FUEL | NAVY SPECIAL | OTHER | TOTAL |
|---|---|---|---|---|---|---|---|---|
| DEFENSE | 57.567 | 478.078 | 0.185 | 0.023 | 2,190.267 | 17.607 | 1.572 | 2,745.299 |
| CIVILIAN | 206.427 | 72.972 | 0.299 | 3.181 | 63.241 | 0.003 | 8.284 | 354.407 |
| | 263.994 | 551.050 | 0.483 | 3.204 | 2,253.508 | 17.610 | 9.856 | 3,099.706 |

AVERAGE COST PER UNIT, BASED ON REPORTS FROM AGENCIES

VEHICLES AND EQUIPMENT

| | | | |
|---|---|---|---|
| GASOLINE | = | 1.03 | / GALLON |
| DIST/DIESEL | = | 0.62 | / GALLON |
| LPG/PROPANE | = | 1.17 | / GALLON |
| AVIATION GAS | = | 2.09 | / GALLON |
| JET FUEL | = | 0.73 | / GALLON |
| NAVY SPECIAL | = | 0.38 | / GALLON |
| OTHER | = | 4.55 | / MILLION BTU |

DATA AS OF 11/30/01

Note: FY 1999 data was used to estimate the non-tactical vehicle component of agency energy costs for FY 2000. Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

# TABLE 14-B
# CONSUMPTION AND COSTS OF VEHICLE AND EQUIPMENT ENERGY BY FUEL TYPE IN FY 2000, FY 1999, AND FY 1985
## (Constant 2000 Dollars)

| ENERGY TYPE | BILLIONS OF BTU | COST PER MMBTU | COST (IN MILLIONS OF DOLLARS) |
|---|---|---|---|
| **FY 2000** | | | |
| AUTO GASOLINE | 31,886.4 | 8.2792 | 263.994 |
| DIST/DIESEL | 122,316.3 | 4.5051 | 551.050 |
| LPG/PROPANE | 39.6 | 12.1997 | 0.483 |
| AVIATION GASOLINE | 192.0 | 16.6907 | 3.204 |
| JET FUEL | 403,051.3 | 5.5911 | 2,253.508 |
| NAVY SPECIAL | 6,426.8 | 2.7401 | 17.610 |
| OTHER | 2,168.4 | 4.5453 | 9.856 |
| TOTAL | 566,080.9 | | 3,099.706 |
| AVERAGE COST PER MMBTU = $5.476 | | | |
| **FY 1999** | | | |
| AUTO GASOLINE | 41,091.2 | 8.9785 | 368.936 |
| DIST/DIESEL | 116,571.7 | 5.8177 | 678.183 |
| LPG/PROPANE | 79.2 | 8.3359 | 0.660 |
| AVIATION GASOLINE | 132.1 | 14.0200 | 1.852 |
| JET FUEL | 444,680.5 | 6.5634 | 2,918.636 |
| NAVY SPECIAL | 4,543.9 | 3.5318 | 16.048 |
| OTHER | 428.6 | 8.4661 | 3.629 |
| TOTAL | 607,527.2 | | 3,987.943 |
| AVERAGE COST PER MMBTU = $6.564 | | | |
| **FY 1985** | | | |
| AUTO GASOLINE | 50,420.1 | 10.9684 | 553.028 |
| DIST/DIESEL | 169,215.0 | 8.7566 | 1,481.743 |
| LPG/PROPANE | 149.2 | 10.1752 | 1.518 |
| AVIATION GASOLINE | 1,882.3 | 16.2086 | 30.509 |
| JET FUEL | 705,675.5 | 9.4625 | 6,677.444 |
| NAVY SPECIAL | 6,687.7 | 8.1208 | 54.309 |
| OTHER | 238.6 | 7.8287 | 1.868 |
| TOTAL | 934,268.4 | | 8,800.421 |
| AVERAGE COST PER MMBTU = $9.419 | | | |

DATA AS OF 11/30/01

Note: FY 1999 data was used to estimate the non-tactical vehicle component of agency energy costs for FY 2000. Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

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